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ENQUIRY

INTO THE

MEDICINAL VIRTUES

OF

BRISTOL-WATER:

AND THE

INDICATIONS of CURE
which it answers.

By GEORGE RANDOLPH, M.D.

Late Fellow of *All-Souls College, Oxford.*

—— Παρ' ἐμ' ἰσ-ασο, καὶ ἴδε ἙΡΤΟΝ.

Hom. Il. ρ'. 179.



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T O

Edward Wilmot M.D.

Physician in Ordinary to His MAJESTY,

A N D

His Royal Highness the Prince of WALES;

Fellow of the College of Physicians,

and of the Royal Society.

S I R,

I Humbly offer You this Product of my Studies, in Acknowledgment of many Favours receiv'd from You, and in full Perswasion that No One is a better Judge or a greater Encourager of Writings of this Kind. That I was permitted to address this Work when imperfect, to a Person so

eminently distinguish'd in his Profession, is an Honour of which I shall ever retain the most grateful Sense, and I shall esteem your favourable Acceptance of it, now it is compleat, as an additional Instance of your Goodness to, Sir,

Your most obliged

and obedient

humble Servant

GEO. RANDOLPH.

P R E F A C E.

AS I cannot think the Virtues of Bristol-Water sufficiently understood, and believe there are many of the Faculty, who would be glad to be informed, how far they may rely upon it; I hope I may be excused in attempting to explain what my particular Station in this Place obliges me to enquire into, and what I really have taken some Pains to acquaint myself with.

True it is that the general Disorders, for which this Water is of Service, have already been made publick; but the particular Indications which it answers, (the one Thing needful for every Body to know before he can judge of it as a Remedy) seem either not truly, or not fully explained. Some Writers deal too much in generals, and others who are more particular, have been more earnest in searching into the Nature of its Contents, than observing its Effects;

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*fects ; not considering the Weakness of the Foundation they build upon. For, not to mention the many notorious Contradictions of these Writers between themselves, our Reason sufficiently teaches us, that Chymical Analysis is by no means the proper Method of Proceeding in this Case ; but that after all our Search, the little Knowledge we have of what is done under the Earth, must ever leave us ill and incompetent Judges of the Products of it ; for 'till we are acquainted with all the different Substances there lying hid, and all their possible Combinations, together with the Effects resulting from them, how can we pretend to say, that the Virtues of any mineral Waters depend upon such and such Substances found in them by Chymical Analysis ?—— Whilst, for ought we know, they may not at all be concerned in the Effects ; and if they are, it may be in Conjunction with some one or more other Substances, which we are ignorant of, as we are of the Effects following such Conjunction. Again ; supposing we could arrive at a certain Knowledge concerning every separate Ingredient, the Qualities arising from the Mixture might possibly be very different from any Thing we find in the Ingredients, and we not be able to produce the Compound as Nature has.——But enough of this ; Mr. BOYLE
having*

P R E F A C E.

having long since given his Opinion, * “ That the
“ Difficulty of securely determining the Effects of
“ Mineral Waters a priori is little, if at all, less
“ than insuperable to Human Understandings.—And
“ that the surest Way of knowing them, is by a
“ long and sufficient Experience of their good and
“ bad Effects.”

Waving therefore all Chymical Experiments, as a subsequent Affair, I shall consider the Water as a Medicine sui Generis, which Nature has provided for our Use, and in order to find out the Virtues of it, I shall proceed in the following Manner.

First, I shall give a Medical History of it, (so far as we can trace it) from its first Discovery, until now; endeavouring to shew “ what has been
“ the current Opinion of Physicians concerning it;
“ what Diseases it has been principally used and
“ esteemed for, at different Times since; and for
“ what it is now at this Day in Reputation,” thereby attempting to give such a general Idea of this Water, as may conduce to the more exact and extensive Knowledge of it.

* Boyle’s Memoirs for the Natural History of Mineral Waters, p. 3, 4.

And

P R E F A C E.

And for the better ascertaining of such Cases, as Physicians shall think proper to send here for Relief, I shall in the second Place enquire into the Nature and Cause of such Distempers, as it is found more specifically to hit; thereby endeavouring to find out what Indications it answers, how far it may be depended upon in the many different Disorders it is good for, and how far not.

And this being done, I shall in the third and last Place, enter into an Examination of the Properties and Qualities of it, so far as they are discoverable by Experiments; and here I shall take Occasion to enquire into the usual Methods, by which this, and other mineral Waters have been examin'd.



 PART I.

A
 MEDICAL HISTORY
 OF THE
 HOT-WELL-WATER
 NEAR
 B R I S T O L.

THE Hot-Well-Water Spring rises on the Bank-side of the River *Avon*, about a Mile below *Bristol*, between * high and low Water-Mark: It is said to have been known long since to the Sailors, who coming by in their Boats, first discover'd it, and used it outwardly (as Tradition informs us), for the Itch, and healing up of old Sores: But, as it is not mentioned by any Writer, nor attested to by any known Facts, 'till after the Beginning of

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* The Spring rises about 26 Feet below High-Water Mark: the whole Difference between this and Low-Water being about 36 Feet.

the last Century, it was probably, but little regarded, 'till that Time, when, from its passing freely by Urine, it began to gain a Character as a Diuretick, and so came into Repute for Nephritick Cases; and its Virtues in this particular seem to be what chiefly contributed to bring the Water into Use.

The first Author that I know of, who mentions it, is Dr. *Edward Jorden* of *Bath*, who, in his Discourse on Mineral Waters, publish'd in 1632, barely names the *Bristol-Water*, by *Saint Vincent's Rock**, but seems, though he lived so near, and was no incurious Enquirer, to be very little acquainted with it, in that he ranks it among the Chalybeates, with *Spa* and *Tunbridge Waters*.

The next to him is Mr. *Thomas Johnson*, who, in his *Mercurius Botanicus*, says, he was upon the Spot, 17 July 1634†, “ where
“ from the Clefts of the Rocks, says he, issues
“ forth a Spring of warm Water, pleasant
“ to the Taste; it is a Water of some Repute,
“ and much commended for ulcerous and
“ calculous

* *St. Vincent's Rock*, so called from a Chapel, which stood formerly on the Top of it, dedicated to that Saint, who was a Native of *Spain*, and suffer'd Martyrdom at *Valencia*, *Anno Dom.* 305.

† *Mercurius Botanicus*, p. 12.

“ calculous Affections of the Kidneys, taken
 “ inwardly ; and for old Sores, applied out-
 “ wardly. It is in pretty frequent Use, and
 “ not without Success, as I am inform’d by
 “ those who have experienced it.” And this
 is the first Writer, that I know of, who posi-
 tively says, what the Water was reckon’d
 good for. Who first applied it to Ulcers of
 the Kidneys does not appear : Possibly, as it
 was a kindly Wash for outward Ulcers, it
 might be deem’d of equal Service to inward
 ones, in a Part through which it so mani-
 festly passed ; or, as Ulcers are often compli-
 cated with Stone and Gravel, the Trial might
 be natural, and the Success of it first appear
 from Experience. But be this as it will, it is
 plain this Water was now in some tolerable
 Credit, tho’ the precise Time *, in which its

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Virtues

* By all the Enquiry I can make of ancient Persons, now living, they not only say, that they never could learn by what means it was first found out, but also that they never could hear any Account given, when it was first inclosed. For, before the late Alterations were made, the Water was inclos’d in a Brick Cistern, about 3 Feet long, 2 Feet broad, and 4 Feet deep ; the Bottom whence the Water sprang being unpav’d. Out of the South-side of this Cistern came a wooden Pipe about four Feet long, 14 Inches square, whose Bore was about 3 Inches Diameter. This Pipe emptied itself into a little Pond beneath, about 8 Feet square ; and in this Pond it was that People used to wash themselves, letting the Waters run from the Pipe upon their Sores : But no one can I find, who remembers, or can give me any Account, when, and by whom this Inclosure was made.

Virtues in any one particular were first discovered, I cannot learn; nor indeed is it to be expected I should, since there is no fixing the first Original of that which, from many and repeated Trials, comes gradually into Use.

Dr. *Venner*, in his second Edition of his *Via recta ad Vitam longam*, published in 1622, says nothing of this Water; whereas in his third Edition of 1650, he has a small Treatise expressly upon it. How far this will warrant us in supposing, that it was in no great Repute, 'till after the first of these Dates, I leave to my Reader to judge. In this Treatise he tells us, “ That this Water was frequented for no other Use, but the Stone; “ though, saith he, it hath also other excellent Qualities: It notably cooleth the Inflammations of all the inward Parts, and yet does not offend the Stomach, as some other Waters do, and is withal of a gentle mundifying Quality. It is therefore very effectual against the burning Heat of the Stomach, Inflammations of the Liver and Reins, and Aduſtion of the Humours, being taken with fine Sugar, a Dram to a Pint. In such as have hot Livers, red pimply Faces, and aduſted Humours, I have caused a Tincture of Roses and Violets to be
“ made

“ made therewith, with singular Success:
“ In Inflammation, and Siccity of the Inte-
“ stines, it is good to give, with this Water,
“ *Mel violar. solut.* In Inflammations of
“ the Kidneys with Obstruction, and where
“ there was withal hot Livers, I have given
“ it with *Chrystal. Miner.* with wish'd Effect,
“ for the Distemper of the Kidneys was not
“ only quickly allay'd therewith, but also
“ abundance of Sand, and other drossy Mat-
“ ter purg'd off. That this Water is good
“ against the Stone and Strangury, and pu-
“ rulent Ulcers of the Kidneys and Bladder,
“ is evident, by reason of its mundifying
“ Quality. This Water is also good in Ulce-
“ rations of the Intestines, with this Proviso,
“ that it be taken with some convenient
“ Adjunct, as *Mel Rosar.* to occasion the
“ Passage thereof, through the Belly, divert-
“ ing it from the Veins. This Water is not
“ to be given to such as cannot excrete, and
“ pass it away by Urine; neither is it to be
“ given to such as have cold Stomachs, weak
“ Livers, feeble Brains, and such as are sub-
“ ject unto Rheums; in a word, not to
“ phlegmatick, nor to any that abound with
“ Crudities, or have a cold and moist Habit
“ of Body; for, in all such, it will soon in-
“ fringe the natural Heat, breed Rheum, an-
“ noy

“noy the Breast, occasion Cramps, and by
 “filling the Body with watery Superfluities,
 “incur a Lethargy, Palsy, or some other De-
 “bility of the Limbs, and Sinews: As for
 “outward Uses, he says, the Water may as-
 “suage the Itch, mundify and palliate old
 “Sores, but no Matter of Moment is to be
 “expected from it.”

This Account lets us into a little farther
 Knowledge of the Nature of this Water, as a
 Cooler of the Blood: “It notably coolerth
 “Inflammations of all the inward Parts.—It
 “is of Service in hot Livers and Reins, Adu-
 “stion of the Humours, and red pimply
 “Faccs;” all which might perhaps be as well
 express’d by scorbutick Heats, for which it
 now stands famous. And this Quality of it
 appears farther, in that he informs us, that if
 this Water is given in cold moist Constitu-
 tions, or does not pass by Urine, it will pro-
 duce cold Diseases. He allows of its Virtues
 in the Stone, and Ulcers of the urinary Pas-
 sages; but particularly in the former, for
 which it was principally frequented; he be-
 lieves that its good Effects in both are owing
 to its “cleansing mundifying Quality;” by
 which I presume he means, that it both de-
 terges Ulcers, and washes away Gravel. And
 for

for the same Reason, he also thinks it good for Ulcerations of the Intestines ; but as to Ulcers of any other Part, he is quite silent ; from whence I conclude, that it was used for such Ulcers only, as the Water, in its Passage, was suppos'd actually to wash and keep clean. As for outward Ulcers, his Opinion is, that little is to be expected from it.

In 1655, we have a Letter extant from Dr. *Maplet* to Dr. *Bate*, in which, speaking of a young Lady who had received no Benefit from a long and continued Use of these Waters, “ So powerful an Effect have they, “ says he, in voiding Gravel, that as she has “ drank them all this while, and discharg’d “ none, I could almost venture to conclude “ she has none.” And again, “ when I consider the extraordinary healing Quality of “ these Waters, and the little good they have “ done her, I am apt also to think, she can “ have no Ulcer in her Kidneys ; for I have “ seen cancrus Sores of the outward Parts, “ which I thought incurable, healed by them, “ as it were by Miracle, in less time than this “ Lady has been there. The Method they “ used, was to let the Water (which runs “ down from a wooden Pipe upon a Pavement beneath) fall upon the Part, and, having “ ing

“ ing well wash’d it, to wet a Cloth in the
 “ Water, and wrap the Part up with it four
 “ times doubled : The very first time of using
 “ it, it would give Ease; then the Sore would
 “ assuage, then change Colour for the better,
 “ and so heal : And the Patient used to
 “ drink of the Water daily during the Cure
 “ *ad libitum* : Now, I say, if this Spring is of
 “ such wonderful Efficacy in so very malign-
 “ ant Ulcers of the outward Parts, why should
 “ it not exert itself in the Kidneys which
 “ it runs through, and heal Ulcers there?”

The same Dr. *Maplet*, in a Letter dated
 1668, written to Dr. *Creyghton* Dean of
Wells (afterwards Bishop), says, “ But if you
 “ receive little Benefit from what I have pro-
 “ posed, I really should advise you to *Bristol*-
 “ Water ; which is of excellent Virtue in all
 “ Disorders of the Kidneys and Bladder
 “ whatsoever.” And again, in a Letter wrote
 the *January* following,—“ You’ll consider of
 “ the Advice I gave you, about drinking our
 “ Waters, and be persuaded, I hope to come
 “ and try their Effects in the Spring, when
 “ the warm Weather comes on.” And again,
 in a Letter, dated *April 7*, 1669, “ In my
 “ Opinion you should come to *Bristol*, to
 “ drink our Waters ; which are very benefi-
 “ cial

“ cial to the Kidneys and Bladder, be the
 “ Case either Stone or Ulcer ; which also
 “ greatly cool and temper the Blood, and
 “ thereby soften the Urine which is dis-
 “ charged from it.”

In another Letter to Dr. *Wall*, he speaks of *Bristol* Water, and describes the Place whence it springs ; telling him, “ it is
 “ counted good for Nephritick Cases, and
 “ that he rests his Cure upon this Water,
 “ drank of * *largely*, upon an empty Sto-
 “ mach, at such times as the *Tide per-*
 “ *mits* †.”—

These Letters contain the Testimony of one, who practis'd Physick upon the Place, and therefore could not be unacquainted with the Character this Water then bore ; and yet he says nothing more of it than others had said before him, only he extols

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it

* They drank it formerly in greater Quantities than they do now.

† It is plain from what has been said, that, when the Tide rose even with the Spring, it must mix with it and foul it. But there was still a further Inconvenience ; for altho', when the Tide rose, the Water would continue clear, 'till it came up to the Spring, yet when the Tide sunk it was not so ; but the Spring would continue foul for some Hours after the Tide had sunk below it ; so that the Times of Drinking were but seldom, and they altering every Day.

it greatly, both as to its outward and inward Uses. He indeed says, that “ it is “ good for all Disorders whatsoever of the “ Kidneys and Bladder:” But this can mean no more, than that it is in general friendly to those Parts; because as it will not suit all, so there are some which it does suit, which he knew nothing of; it being at that time famous for nothing more, than for washing of outward Sores and Humours, and for calculous and ulcerous Affections of the urinary Passages. But is it not surprising, that neither of these Gentlemen should specify *what Sort of Sores* they more especially healed outwardly; and, as to their inward Use, that they should not distinguish between Stones that are passable and Stones that are fixed; or tell us of the respective Service they are in each Case?— That they should confound the Stone in the Bladder with the Stone in the Kidney; and give us no Cautions, concerning the Application of this so powerful Remedy; not even so much as to tell us, when it is of most Service, in the Fit, or out of it; how far cold Constitutions may venture upon it, &c. but only tell us in general, that it is of a cooling or cleansing Nature; and thus, by general Words, leave us to guess,

guess, at what perhaps they never diligently enquired into: As for Dr. *Maplet*, he indeed writes only to his particular Patients, and therefore cannot be expected to say so much, as if he had wrote professedly on the Subject; though had it had any farther Excellencies, it is probable both would have been ready enough to urge them. That its Virtues in consumptive Cases were not known at this time, appears from Dr. *Bennet*, who wrote his *Theatrum Tabidorum* in 1650. In which we do not find a Word said of the Efficacy of *Bristol-Water* in this Distemper, though this Gentleman was himself in a Consumption, and practised Physick in his younger Days at *Bristol*.

I shall now turn to some other Testimonies concerning it. In *Fuller's Worthies*, printed 1662, we have the following Account: “ St. *Vincent's* Well, lying West of
 “ the City of *Bristol*, under St. *Vincent's*
 “ Rock, and hard by the River, is sovereign for Sores and Sickneses, to be
 “ washed in or drank of, to be either outwardly or inwardly applied; it hath a
 “ rusty ferrugineous Taste, which it retaineth, though boiled never so much. Experience proveth that Beer brewed there-
 “ with,

“ with, is wholesome against the Spleen ;
 “ and Dr. *Samuel Ward*, afflicted with that
 “ Malady, and living in *Sidney College*,
 “ *Cambridge*, was prescribed the constant
 “ Drinking thereof, though it was costly to
 “ bring it through the *Severn*, and narrow
 “ Seas, and thence by the River to *Cam-*
 “ *bridge*.” This is so very imperfect an Ac-
 count, that it is highly probable he knew
 nothing of the Water, but by Report,
 which is *tam ficti pravique tenax, quam*
Nuncia veri. Nor indeed should I have
 thought him worth quoting, were it not
 that he pronounceth the Water good
 against the Spleen. A Virtue, I am sure
 does not belong to it, nor can I find out,
 who first taught it did. Probably, as it
 shewed itself as a Diuretick, and might in
 some scorbutick Hypochondriacks agree
 well, it was imagined to be of no small
 Efficacy this way, especially as it had been
 hitherto supposed to be impregnated with
 Iron ; a Character which it will appear from
 what follows, to have kept much longer
 than one could believe, if those only had
 wrote of the Water, who were acquainted
 with the Nature of it.

In 1672, *Claromontius* published a Treatise, *de Aere, Aquis, & Locis Angliæ*, in which he speaks of *Bristol-Water*, as good for the Gravel, and Obstructions of the Intestines: As to himself he tells you, they did not agree with him by any means, for they made him puke, and did not pass as they should do by Urine; he fancied them of an acerb Taste, and tells you they are a harsh Water, and that if they do not pass by Urine, they either come up again by Vomit, or gripe the Bowels and cause Ruptures.

As this Gentleman, tho' a Physician, was a Stranger, we cannot expect so accurate an Account of them as from those acquainted with the Place; especially as he conceived a Dislike to them. So far he says true, that, where they do not pass, they may be apt to make the Stomach sick, and gripe the Bowels; but, as to the acerb Taste, and their being good for Obstructions of the Intestines, he seems rather guided by what others had said, than what he himself had experienced. For, as it was pronounced by *Jorden* to have Iron in it, many would have it, that it had an acerb ferrugineous

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Taste;

Taste ; whereas no Water seems softer to the Palate than this does. But the ignorant Part of Mankind are so ready to assure us of more than they know, and the inquisitive Part so ready to believe them, that we must not wonder at Mistakes of this Nature. And thus between those Writers, who are too superficial in their Accounts of this Water, and them who are misinformed, we are (as in most other Parts of the *Materia Medica*) left very much to our own Experience ; but with this Difference, that whereas the Use of other Medicines may be examined into any where, this only can be learnt upon the Spot.— Yet thus far I think, we may fairly collect from what has been said, that whatever might be the Opinion of some particular People, the Water was not yet of any established Credit, except as to calculous and ulcerous Affections of the Kidneys and Bladder, taken inwardly ; and to divers Sores and Humours applied outwardly.

And this is confirmed by the Testimony of Mr. *Onesiphorus Tyndal*, now living, who came to *Bristol* in 1674, at which Time he informs me, that this Water was in Use chiefly for the Stone and Gravel, that

that People usually washed themselves with it for the Itch, with great Success; but as to any thing further, it was in no Reputation, till such time as it was found out to be a Cure for the Diabetes. The Occasion of which Discovery, he assures me, was as follows: It happened about the Year 1680, that two or three Persons of Note in *Bristol* died of this Distemper; the Physicians acknowledging and bewailing the Inefficacy of their Art in such manner, as it was looked upon by every Body to be incurable. One Mr. *William Gagg*, a Baker, who lived in *Castle-street*, being seized with it, was accordingly despaired of by all that knew him; but dreaming One Night, that he drank plentifully of the Hot-Well-Water, and was wonderfully refreshed by it, he was much inclined the next Morning to quench his Thirst with it, and found it to answer to his Wish so effectually, that by continuing the Use of it, in a few Days he came abroad, gathered Flesh and Strength daily, and recovered to the great Surprise of every Body that knew him. This one remarkable Instance was sufficient to recommend this Water to others labouring under the same Disorder; and accordingly it was found to answer Expectation, and
was

was soon brought into Reputation for it.

In 1688, Dr. *Etwall*, who is *now living* *, came to *Bristol*: He informs me, that this Story was then averred to him for Truth; that People then depended on it for the Cure of a Diabetes; but that it had not gained Reputation sufficient to draw much Company thither.

In 1690, Dr. *Guidot* published his Book *de Thermis Britannicis*, where he has a particular Treatise on *Bristol-Water*; in which he has not only collected all that Dr. *Venner* and *Maplet* had said, but adds, that it is good for the Wind in the Stomach, the Cholick in the Bowels, a Diarrhæa, Dysentery with Excoriations of the Intestines, but more especially for the Diabetes, and *Flatus Hypochondriacus*: For which latter he quotes *Fuller's* Authority, and gives a Copy of a Letter from Dr. *Harbeck*, Physician of *Bristol*, confirming its Virtues in a Diabetes.

It is very probable, that this new Discovery much excited the Enquiries of Physicians
con-

* Dr. *Etwall*, and Mr. *Tyndal*, both died since the first Edition of this Treatise.

concerning this Water, and that Dr. *Guidot* might, for that Reason, chuse to enlarge upon it, though he does not seem to have sufficiently acquainted himself with its Nature ; else surely he could not pronounce it good in a windy Cholick, it being one of its most common Inconveniencies, that it is apt to chill the Stomach, and gripe the Bowels : And therefore I am of opinion, that this with his *Flatus Hypochondr.* is of a Piece with the mistaken Notion of *Fuller's* about the Spleen, and perhaps deduced from it. His mention of a Diarrhæa is new, and was perhaps one of the first Conclusions from this new Discovery ; the Benefit received in one Kind of Flux, directing them to the Trial of it in another : And this might farther encourage them to apply it to a Dysentery ; especially, as it had before been recommended for Ulcerations of the Intestines. But these good Effects of it seem built rather upon Surmise, than Experience.—Dr. *Guidot* had likewise probably heard, that the Water was good for a Consumption and Hæctick ; another probable Conclusion from its curing a Diabetes : But that he knew very little of the Matter, appears from his commending *Bathing* in it (not drinking it) for that

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Purpose,

Purpose, and wishes that there was a Receiver at the Spring-head, large enough for People to go in.

About this time it was, that the City began to think the Water worth their Care, and proposed securing it from the Tide, which made it very inconvenient for those that needed it; and accordingly, in 1691, Sir *John Knight*, Mayor of *Bristol*, endeavoured to inclose the Spring, in such manner as that the Tide should not mix with it; and, for this purpose, raised a Stone-work round it, which being built higher than the Tide ever rose, was conceived sufficient to keep it out: But the Weight of the Water inclosed altered the Course of the Spring, and put them in fear of losing it.

In 1695, the Merchants of *Bristol* granted a Building Lease to certain Proprietors, to secure the Spring, and contrive, if possible, that the Water might be had as well at High as Low-water; which Proprietors found the Spring, and made a proper Foundation for Pumps, which now carry the Water near Thirty Feet high; the Tide-water being kept out by means of Pipes, which

which carry the Spring-water into the River, and have Valves, which open, to let the Water out, but shut against any that would force itself in. But, nevertheless, it is found by Experience, that the High Tides will mix with the Spring, and foul it, (which they can do no other way than by some unknown Clefs in the Rock) and the Water continues foul for some time after the Tide is sunk.—From this time other Persons began to build, and make the Place commodious for the Reception of Company; and so it came, by degrees, into the Repute it is in at present.

There were now two standing Principles, which every one who was inquisitive into the Nature of the Water might build upon; *First*, Its Virtues in calculous and ulcerous Affections of the Kidneys and Bladder: *Secondly*, in a Diabetes. Men now began to perceive that its Virtues, as to the first, could not be owing to any forcing diuretick Quality; for, if so, how could it cure a Diabetes? And therefore it was more probable, that the Good obtained this way was rather owing to its cooling Nature, by which it might serve to allay the Inflamma-

tion and Pain caused by Stone or Ulcer. And, by giving Ease, it gained a Reputation for these Disorders, and that very deservedly; because, in Cases where the Stone or Gravel is passable, whatsoever allays the Inflammation, not only gives Ease, but Room also for the Stone to pass; especially, if it supplies the Body at the same time with Matter to pass, as Water certainly does. And we observe, that in fixed Stones the Service done is generally no more than may be accounted for from this one Consideration. And the same may in some measure be said of Ulcers; though, as there is another Circumstance to be attended to, we must not make our Conclusions without it; and this is, its Virtues in a Diabetes; a Distemper supposed to arise from a Weakness and Laxity of the Kidney: From which it was obvious to conclude, that it had also an astringent Quality, by which it might conduce to the healing and drying up of Ulcers, as well as asswaging the Inflammation attending them; and that it might not only ease Pain, and discharge Gravel, but also by strengthening the Kidneys guard against it for the future,—And this was further confirmed, in that its Virtues in outward Sores were directly accounted for
from

from these two predominant Qualities; it being good only in such Sores and Humours, where the Indications are cooling and drying. And this new Discovery not only gave Men a better Idea of the Benefits before received, but also greatly extended the Use of this Water; for now they began to apply it to every Purpose of cooling and astringing. No Distemper was thought too hard for it, in which either, or both of these were indicated. One of the first Conclusions was, that great Good might be expected from it in Diarrhæa's and Dysenteries, and other colliquative Discharges; *next*, that it might be of service in all seminal and uterine Weaknesses; *thirdly*, that all Heats, whether hectic or scorbutical, Consumptions, and all Disorders proceeding from the Acrimony of the Blood, might be cured by it. How far it answered in these Particulars will appear in the Sequel of this Discourse. So far is reasonable to believe, that these two Principles of Cooling and Astringing, which now seemed to manifest themselves in this Water, were the Ground-work of all the late improved Uses of it; and indeed the Virtues of this Water may not improperly be said to arise from a due Consideration
of

of these two different Qualities. Where they both jointly contribute to the Cure, they are little less than specifick: Where they clash, they are not so much to be depended on. It is therefore incumbent upon the Physician to consider well the Circumstances of every particular Case, and where he finds any Contra-indications, to qualify, if possible, the Inconvenience, and to make them serviceable to the Point he aims at. But, lest I should be thought not to pay a proper Deference to what others have said, I shall proceed to give an Account of such Authors as have taken notice of this Water since the Discovery of its Virtues in a *Diabetes*.

And first, I am something surpriz'd to find so little Notice taken of this Spring by the Writers of Natural History. For, except that Sir *Robert Atkyns*, in his *Ancient and Present State of Gloucestershire*, printed 1712, just says of it, that, “ it is a
“ Remedy famous for divers Diseases, espe-
“ cially the Diabetes,” I know not of any that have mentioned it. In the late Edition of *Camden's Britannia*, though translated and improved by so able a Hand, we do not find a Word of any such thing, though
both

both in the Edition of 1695, and in that of 1723, there is a Note upon the Diamonds of St. *Vincent's* Rock, nothing near so famous as its Water, *Qualis Gemma micans, pretio sed major*.—It were indeed to be wished, that some one or other of the Physicians of the Place had published their Sentiments of it: But, as this has not been the Case, we must content ourselves with such, who, if they knew less, presumed more: For, in the Space of Forty Years, I find but one Author, who has wrote on the Subject; which is one Mr. *John Underhill*, a Practitioner indeed in Physick in *Bristol*, but by no means qualified, as I am told, for such an Undertaking. This Gentleman finding, as he says, no satisfactory Account of the Water extant, undertakes to give one, and dedicates his Book to the Mayor and Corporation. This Book bears Date 1703, and is entitled, *Johannis Subtermontani Thermologia*. It consists chiefly of a Collection of Cases, extracted from a List of Cures, which was formerly kept at the Well-house; by which he would establish the Use of the Water, not only in *Diabetes*, *Gravel*, and *Scurvy*, but also in *King's-Evil* and *leprous* Disorders; and, in short, in every thing. “ This Hot-well
“ Water,

“ Water, says he, will extinguish the Flame
 “ in all *Synochi*, and putrid, if not malign-
 “ nant Fevers: It is *Instar omnium*, the
 “ last and only Refuge in Hecticks, and
 “ Dyscrasy of Humours. It is of excellent
 “ Merit, *a Capite usque ad Calcem*, in all
 “ Cephalick Cases, and Ataxy of the Spi-
 “ rits, and Palsies, and other Impotencies;
 “ and, as to external Uses, it is a trusty
 “ Asylum in all left-off incurable Ulcers,
 “ Fistula’s, and eroding Sores, if not Can-
 “ cers.” And, in proof of all these Won-
 ders, he has his Cases signed by the Patients
 Names. Thus we see, what a Medley of
 Conclusions may arise, when People are left
 to tell their own Case, and these Relations
 built upon as Matters of Fact.—To under-
 stand the Nature of a Disorder, to observe
 the Operation of Medicines, and to give a
 faithful and exact Account of a Cure, re-
 quires more Attention and Capacity, than
 the Generality of Mankind are Masters of;
 not to mention how very apt we all are to
 magnify every thing that relates to ourselves.
 There are doubtless some anomalous Cases,
 which have met with a Cure from these
 Waters: But what Conclusion can we
 draw from hence? only that this, like
 other Medicines, will sometimes have very
 I surprising

surprising Effects. Besides, it is well known, that hot scorbutick Blood may possibly shew itself in divers terrible Shapes, and yet the *Causa Morbi* be nothing more than what is easily curable by these Waters. I shall however recite the List he gives of the Distempers, for which, he says, the Water was famous in his Time; which, though not just, may serve to shew us some of the improved Uses. “ It is of excellent
 “ Merit, says he, in all Cachochymy,
 “ Cholick, bilious Vomitings, Cardialgia,
 “ Dysenteries, and Fluxes of all Kinds,
 “ Fevers, and all hectical Cases, all lavish
 “ Sweatings, all Rheumatick Pains, all
 “ Herpetes, Pustules, Itch, Scorbute, all
 “ Inflammations and sulphurous Eruptions;
 “ all Sorts of Ulcers, whether inward or outward,
 “ Asthma, King’s-Evil, Dysuries, Diabetes, Kidney Gravel, Bladder, and other Excoriations; it extinguisheth all Thirst; it is rather binding,
 “ than laxative.” In another Part of his Book, he observes, that “ it is of excellent
 “ Use in Sterility, Debility, or any Fluor,
 “ or Slipperiness of the Parts, by its fortifying the Vessels, and contempering
 “ the Humours.” He tells us moreover,
 “ of its Virtues in hectick and colliqua-

“ tive Sweats.” From all which it appears, that it was looked upon as a great Temperer of acrimonious Juices, and as a Binder and Strengtheners of relaxed Parts; and, that it was extended to every Disease, of which either of these was the supposed Cause; with what Success, I fear, our Author is too vehement in his Praises, to be received as a credible Witness.

In the Year 1725, Dr. *Wynter* published his *Cyclus Metasyncriticus*, in which he professes to give an Account both of *Bath* and *Bristol* Water, their several Virtues and Differences. But, I can by no means think, he has acquitted himself of his Promise; nor is it to be expected he should, having, as he tells you in his Preface, wrote this Performance on board a Ship, in his Passage from *Jamaica* in about four Weeks. His List of the Diseases, for which *Bristol* Water was then famous, is as follows. “ Internal Hæmorrhages and In-
“ flammations, as Blood-spitting, Dysen-
“ tery, and immoderate Fluxes of the
“ Menfes, purulent Ulcers of the Viscera,
“ hence in Consumptions. &c. Dropsy*,
“ Scurvy

* *Dropsy*. Perhaps some may be surpris'd, says our Author, to find *Bristol* Waters prescribed in Dropsies: But
since

“ Scurvy with Heat, Stone, Gravel, Strangury, and habitual Gout; scorbutick
 “ Rheumatism, Diabetes, slow Fevers,
 “ Atrophy, Pox, Cancers, Gleets in both
 “ Sexes, King’s-Evil.” And yet, for all this, he is so inaccurate, as to say in a Page or two before, that Dr. *Venner* had wrote of it 70 Years ago, and recommended it in all Distempers, for which it now stands so famous, except the Diabetes. The chief Motive that induced the Doctor to write of this Water was, to oblige Dr. *Friend* with a Comparison betwixt the Mineral Waters of *Bath* and *Bristol*. What he says of this Matter, is as follows:
 “ *Bath* Waters are beneficial, where the
 “ Secretion is diminished: *Bristol*, when
 “ too much increased. *Bath* attenuates
 “ powerfully: *Bristol* incrassates. *Bath*
 “ is spirituous, and helps Defect: *Bristol*
 “ is more cooling, and suppresses Plenitude. *Bath* Waters rouse up the too
 “ languid, and quicken the too lazy Circulation:

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“ culation :

Since no one can doubt, that diuretick and drying Medicines are of great Service in this Disease; and, it is also evident, that *Bristol* Waters have these two Qualities in a great Degree, *Ergo*—But, if we consult Experience, it will prove the Doctor egregiously mistaken; all the Water a dropfical Man drinks not passing, but lodging within, and increasing the Disease.

“ culation : *Bristol* allays Heat, and re-
 “ strains the too rapid Motion of the Blood.
 “ *Bath* invigorates the Phlegmatick :
 “ *Bristol* attemperates the Cholerick Con-
 “ stitution. *Bath* Waters seem to be de-
 “ dicated to the Maladies of the Stomach,
 “ Guts and Nerves : *Bristol* to those of the
 “ Lungs, Kidneys, and Bladder.” Again,
 “ *Bath* Waters are at variance with a Milk
 “ Course, and *Bristol* never judiciously
 “ directed, but where that may be joined
 “ with Reason and Success.”

Thus, from a simple diuretick Water,
 calculated for some few Disorders of the uri-
 nary Passages, are we now arrived at a so-
 vereign Remedy, applicable to some of the
 most stubborn Diseases of the Body. For,
 when once it was found to cure a *Dia-*
betes, nothing afterwards was thought too
 hard for it ;—it was to stop all Fluxes, and
 temper all Humours. And yet this is the
 first Author who mentions its Virtues in
 internal Hæmorrhages ; which, one would
 imagine, might have been guessed at from
 the Beginning, from its cooling Nature
 only ; especially, as its good Effects in
 bloody Urine must appear from the fre-
 quent Use of it in the Stone and Gravel.

But,

But, when it was once known to have also an astringent Quality, the Application of it to inward Hæmorrhages becomes very obvious; though this seems to have been one of the latest Conclusions made. For, unless what is before said of a Dysentery be referred to Hæmorrhage, I don't know of any Writer that has made the least mention of it before this time, not even *Subtermontanus*, who seems to have omitted nothing that he could possibly alledge in Praise of this Water.

There have been, since Dr. *Wynter's* Book, Two farther Treatises published on this Subject; the one by Dr. *Keir*, in 1739, the other by Mr. *Shebbeare*, in 1740; but as both these Authors dwell chiefly on the Analysis of the Water, they will come more properly under my Third Head: However, as the former has given a List of the Disorders in which he thinks *Bristol* Water is principally of Benefit, it will be proper to recite it. After having from the Nature of its Contents deduced the Reason of its Effects, he concludes in the following Manner: “ From this Idea of the
 “ Virtues of *Bristol* Water, it will not be
 “ very difficult to conceive, after what
 “ manner

“ manner it acts in the Cure of the fol-
 “ lowing Distempers, *viz.* Hæmorrhages,
 “ Inflammations, scorbutick and febrile
 “ Heats, cutaneous Eruptions, scorbutick
 “ Rheumatifms, habitual Gouts, Gravel,
 “ Stone, Strangury, Diabetes, some Drop-
 “ sies, Cancers, King’s-Evil, Atrophy, Con-
 “ sumptions; all which, fays he, imply
 “ Obstructions of some Veffels, a Vifciditv
 “ or Acrimony of the Humours, or a Com-
 “ plication of thefe.

But it is now time that I fpeak for my-
 felf, and declare what I think to be the
 prefent eftablifhed Virtues of this Water,
 if happily I can hit the prudent Mean,

*Neve operæ defim, neve immoderatus
 abundem.*

The *first* and principal Virtue is, that
 of tempering the bad Effects of hot acri-
 monious Blood; generally preventing, of-
 ten curing, Inflammations and Hæmorrhage
 from this Caufe; but more efpecially thofe
 of the Kidneys, Womb, and Lungs.

It has, *secondly*, been found of great
 Service in Gleet of both Sexes, and other
 feminal

feminal and uterine Weaknesses; but it is more particularly famous for a Diabetes, in which it is deemed a Specifick.

Thirdly, It is a sovereign Remedy in a hectick Fever: It is a notable Preservative against the Stone, not only preventing Gravel from gathering, but powerfully discharging it when gathered; and is a friendly Drink in all inward Ulcers, but more especially those of the urinary Passages. How far, and under what Circumstances it relieves these Complaints, will appear under my *second* Head.

As to its outward Uses, it is now very little depended on; not, that I doubt of its good Effects in many Cases, where the Indications are cooling and drying. But People do not care to be at the trouble of Bathing; and indeed I cannot think it so efficacious as formerly. For, as the Spring-head is now so inclosed as not easily to be come at; and, as the Water for Bathing is pump'd into Cisterns at a Distance, it loses some of its Heat, and probably some of its Virtue too. And indeed, we advise it now rather as a convenient Cold-Bath than any thing else; though some will go
into

into it, as it comes warm from the Spring.—But, to return to the inward Use of it.

It is found more especially serviceable in all hot dry Constitutions; moistening and cooling the Body, quenching Thirst, creating Appetite, giving Flesh, and increasing Strength.

But it is rather prejudicial to all cold watry phlegmatick Constitutions; chilling the Body, griping the Stomach and Bowels, binding in Humours, and causing Dropsy and swell'd Legs.

As to the sensible Effects of it on healthy Bodies, they are hardly observable; it generally creates Appetite, provokes a limpid Urine, is apt to get up in the Head, like other mineral Waters, as also to bind the Body; and, if taken in too great a Quantity, chills the Stomach and Bowels, and sometimes swells the Legs.— And thus, having finished my *first Head*, I shall now, in the second Place, proceed to enquire into the Nature and Cause of such Distempers as this Water is found more particularly to hit, and first of a hectick Fever.

P A R T II.

*Of such Distempers as may
be reliev'd by the Use of
Bristol-Water.*

C H A P. I.

*Of the Nature and Cause of a hectick
Fever in general.*

IT is universally agreed, that when the Body is drained by Evacuation, the Consequence is often a hectic Fever: Thus, for Instance, Diarrhæa's, Dysenteries, profuse Sweats, Salivation, Diabetes, and other immoderate Discharges, are the frequent Causes, and known Forerunners of this Distemper. Nor does the Reason of this seem very difficult to explain; for whenever the *Egesta* exceed the *Ingesta*, the Body cannot be properly nourished; because the Waste is greater than the Supply: Hence, Loss of Flesh and Strength, continual Heat, Acceleration of the Pulse,

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and

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and all other Symptoms of a Hectick ensue ; which will come on sooner, and continue stronger, according as the natural Constitution is hot or cold, dry or moist ; or, in other Words, according as the Discharges were before, in proportion to the Food, great or little.

Taking therefore Things in this simple View, let us examine whether any Light may be gathered from hence, in hectick Fevers from other more complicated Causes ; such as *inward Ulcers, scorbutic Acrimonies, acute Fevers, &c.*

But, before we proceed, it will be requisite to observe, that it is not every Increase of the *Egesta* above the *Ingesta*, which will cause a Hectick ; for if the Evacuation be of the vital Blood, or such as any way checks the Force of the Circulation, so, as there remains not Vigour enough to carry on the necessary Secretions ; then will the Blood be overcharged with Humidities, and the *Egesta* will no longer exceed the *Ingesta*, but a *Cachexy* will ensue.

But

But if, on the contrary, it shall happen, that the Evacuation made, does not so immediately destroy the animal Strength, only robs the Blood of its more serous Parts, as it will do, if it is by Increase of any of the Secretions; then cannot the Blood be overcharged with Humidities; and the Circulation will be so far from being check'd, that it will, on the contrary, be quicken'd, for want of those Parts which are necessary to allay the Activity of it; on which Account the *Egesta* will continue to exceed the *Ingesta*, and hectical Symptoms will of consequence arise. When therefore we speak of Evacuation being the Cause of a Hectick, it must be understood of such Evacuations only, as are so circumstanced, as to rob the Blood of its more *unactive* Parts.

The most common and obvious Cause of a hectick Fever is *Heat*; which, if once predominant, wastes the Strength, and inclines to this Disorder; not that this is by any means the direct Consequence of Heat, which is more apt to cause Inflammations, and Fevers of another Kind; but when the Blood is only put, as it were,

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upon the Fret, not kindled up into a Flame, then a Hectick is the Consequence. Thus, outward Heat of the Sun, immoderate Exercise, the continued Use of heating Food or Medicine, may occasion this Distemper; for whatever heats the Body, increases the Proportion of the *active* Parts, and diminishes that of the *unactive*; which being once predominant, there is a Waste made of those Parts which are requisite to preserve the natural Crasis of the Blood, and a Hectick will of consequence ensue. And there is likewise a farther Reason, why Heat may cause a Hectick; for as the Rarefaction caused by Heat, both in Fluids and Solids, relaxes and weakens the Fibres of the whole Body, it may happen that some one or more of the Glands, thro' Laxity, shall discharge more than they ought, and so a hectick Fever ensue, from Inanition, as before.

But if this Heat shall meet with an acrimonious State of Blood, and that from any Cause whatsoever, *constitutional*, or *acquired*; then will its Effects be greatly heightened, by reason of the stimulating Nature of such Blood, which will add to the Activity of the Fluids, by increasing the

the Motion of the Solids, and act with further Force.

And if, moreover, there shall not be only *Heat* and *Acrimony*, but also a *Drain* made, by any accidental Flux of Humours, or by the undue Use of any Medicines which increase the Secretions; there the Waste is still greater, and that which was before of itself sufficient to raise a Hectick, by this additional Aid, becomes almost necessarily productive of it.

And thus we are enabled to account for several other manifest Causes of a hectick Fever; such as Excess of Venery, long Watchings without Sleep, Fatigue of Body or Mind, scorbutick or other Acrimonies; all which are plainly reducible to *Heat*, or *Stimulus*, or *Drain*, either separately, or jointly.

The next remarkable Source of a Hectick are *acute Fevers*; which are frequently observed to end in this Distemper, and sometimes to be complicated with it: For, as a Person in a hectick Fever is very subject to Inflammation, it often happens that he is attacked with two Fevers at once; which

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which latter will be so far from giving place to the former, that it will appear the stronger for it, and consequently be the more dangerous. And, on the other hand, an inflammatory, or other acute Fever, may produce a Hectick, and that either before, or after its Crisis; for if it meets with a dry bilious Constitution, a Hectick may arise, even before the Fever is come to its Height, and be complicated with it, much more may it follow after the Fever is over; for as there is hardly any thing that quickens the Circulation, and exhausts the Body more than a Fever, nothing will lay a more likely Foundation for it: And accordingly, we see it the Effect of such Fevers chiefly, which either rage with violent Heat, or leave a morbifick Acrimony behind them; whence arises an active State of Blood, easily taking Fire, upon every slight Occasion, and ever throwing off more than it can spare, which, in this weak State, cannot be done without incurring Danger of a Hectick.

That inward Ulcers, not only of the Lungs, but also of the Liver, Mesentery, Kidneys, Womb, and other Parts of the Body, cause a Hectick, is an Observation as old as *Galen*; though the Cause *why*
has

has not, I think, been sufficiently explained. It is confessed on all Hands, that Ulcers are the Consequence of a preceding Inflammation, which, not being disscussed in time, forms itself into *Pus*, and is usually called an *Abscess*; which, when broke, leaves an Ulcer. From the Inflammation during the making of this *Pus*, we well know there is a considerable Fever raised, which may be of itself sufficient to bring on a Hectick; especially, if we consider, that there frequently is a prior Disposition towards it: When the *Pus* is made, the inflammatory Fever indeed abates, but then another arises (as I conceive) from a new Inflammation, caused by the continual Fretting of the Matter detained in the Ulcer, which will be Stimulus sufficient to raise a Hectick, and, by the Help of a prior Disposition, destroy the Balance of the *active* and *unactive* Parts. For though the Inflammation be small, yet as this Fretting never ceases, so long as the Ulcer remains unhealed, the Fever, though at first hardly perceptible, will in time have the Effects of other Fevers, which greatly exhaust the Body, and tend, sooner or later (according to the Nature of the Ulcer, and the Constitution it meets with) to a hectical State.

I know this Fever has been accounted for, from the *Absorption of Pus*, which getting into the Blood, and circulating with it, obstructs the Vessels, and so causes this kind of Hectick: And, as a Proof of this, it is said we often find *Pus* will pass the Kidneys, salival Glands, or other Emunctories, without any Apostemation of such Parts. But as this seems to me to be a *Deceptio visus*, I cannot altogether agree to it; for the preternatural Secretions of the Glands, may so resemble *Pus*, as not easily to be distinguished from it; as is manifest in a weeping Eye, (not to mention other Instances) which will yield Matter so like *Pus*, as the nicest Judgment cannot discern any Difference; whereas the passing of *Pus* already formed through the minutest Vessels, and the Secretion of it afterwards, in the same Shape again, is no very plausible Conjecture, and ought to be supported with better Proofs than I ever yet heard for it, before it can be admitted for true. I am therefore rather inclined to believe, that the *Pus* is not *absorbed* at all; but that, on the contrary, Nature is very industrious in pushing it forth out of the Body; otherwise, I do not see, how Mat-
ter

ter could ripen, and form an Abscess outwards, and that in many Cases against great Resistance; nor indeed how it comes to pass, that old Ulcers of the Legs, and Issues, should be so great Derivatives of noxious Humours; which, as they are hardly ever kept perfectly clean, would surely on this Supposition be not so safe, much less so beneficial, as Experience tells us they are: It therefore seems probable, that the Reason assigned, is the truer Cause of these *Hecticks*.

But here it may be objected, that if a hectick Fever is caused only by the *Egesta* exceeding the *Ingesta*, it would not surely be so difficult of Cure; because it were an easy Matter to remedy this, by throwing in such Food as is proportionate to the Expence made. To this I answer, that as the Blood consists of *active* and *unactive* Parts, and as the latter of these, are necessary to qualify the too great Activity of the former, if these unactive Parts are in great measure drawn off, as is the Case in hectical Drains, it will be no easy Matter to recover them, nor will any Supply of Food answer to the Waste made: *First*, as it will be too speedily attenuated and consumed by the

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prevailing

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prevailing Activity of the Blood. *Secondly*, as it will find a quick and easy *Exit* at the Outlet made, and thus be rendered ineffectual for the intended Purpose.

And here it may be observed, that as this Distemper may proceed from Evacuations made *out* of the Body, so likewise it may arise from want of Aliment taken *in*, and that apparently for the same Reason. Thus we see long Fastings, Obstructions of the first Passages, Indigestions, &c. sometimes end in a Hectick; though it must be confessed, that it is not so direct a Consequence of these, as of the foregoing Causes. For, as there is no Drain made, the little Food which is taken in, serves in some measure to answer the Expence; and though the Blood be not fully supplied, yet the Proportion of the *active* and *unactive* Parts being not so much altered, the Consequence is rather a slow nervous Fever, than a Hectick*, unless the *Ingesta* are very small indeed,

* One great Difference between a hectick, and nervous Fever, seems to be this, that the one proceeds from a Drain, which hinders the equable Distribution of Aliment; the other from Want of Strength to effect it; hence the Symptoms of a Hectick are simple and uniform, those of a nervous Fever complex and innumerable, depending sometimes on

indeed, or by some Accident the *Egesta* are increased, or the Constitution is very hot and dry.

Nor shall I here omit to mention the hectick Fever, which arises in the last Stage of a *Dropsy*, and is accounted for upon the same Principles; for though in this Case, the Humours are not evacuated from the Body, yet they tend all to one Point; and therefore, in respect of the other Parts which are robbed of their proper Moisture, the Water in the Abdomen must be considered as an *Egestum*, by which the Body is drained in such manner, as the *Ingesta* cannot supply and make up for.

From the whole therefore may we not conclude, that all hectick Fevers proceed from the *active Parts* of the Blood prevailing over the *unactive*? which is occasioned either by the too plentiful *Ingestion* of such Things as encrease the former, or a too great *Egestion* of the latter; so that *Inanition* must ever be considered as a Circumstance essentially requisite, towards the

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Production

on particular, sometimes on general Weakness; and what still makes them more complicated, are the divers unaccountable Spasms that weak Nerves are ever subject to.

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Production of a hectick Fever, and that such Inanition in particular as deprives the Blood of its *unactive Parts*: For although this Fever may be acquired by the Ingestion of such Things as encrease the Activity of the Blood, yet, as I have already observed, this is not the direct Consequence; for the *active* Parts never take Possession, unless where they are able first to subdue and expel the Power of their great Antagonists, the *unactive*; which is brought about chiefly by *encreased Circulation*, or *encreased Secretions*: The latter, directly and necessarily; the former, sometimes directly, but often secondarily, by causing *Inflammation*, *Hæmorrhage*, *Fevers*, &c. of which a Hectick is the frequent Consequence.

C H A P.

C H A P. II.

On the Cure of a HECTICK FEVER.

IF we may be allowed to build upon the Principles laid down, The first and most general Indication of *Cure* will be, to guard against the Evacuation made, and, if possible, stop the Drain; which is effected, by taking away the Causes of it, (*viz.*) *encreased Circulation*, and *encreased Secretions*. Encreased Circulation is caused by too great Activity of the Solids or Fluids, which must be provided against; *first*, by abstaining from all such Things as may either heat the one, or stimulate the other; *secondly*, by administering such Remedies, as shall lower the præternatural Activity of both. *Encreased Secretions* arise either from encreased Circulation, which consumes and carries off the Humours too fast; or from weak Glands, which if they are by any Accident whatsoever so loaded as to be thereby weakened, or so weakened as to be thereby loaded, their Discharges will be encreased. When encreased Circulation encreases the Secretions, the Cure of the Cause is the Cure of the Effect: When the
Glands

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Glands are in fault, though there are divers Methods made use of, for the Remedy of this Evil, yet, I believe, they may in general be reduced to *Derivatives*, and *Astringents*. Other various Methods may indeed take place, by way of prevention, according to what we fear; but when the Secretions are once actually impaired, though some Regard may be had to the original Cause, yet, I say, we do in general depend on *Derivatives* and *Astringents*. But, to be more particular.

And first, as to the *Activity of the Fluids*; which the Art of Physick informs us may be allayed these several Ways; by *Bleeding*, by *Diluting*, by *Acids*, by *cooling Salts* and *Herbs*, by *Incrassants*, and *Emollients*; of which in their Order.

Bleeding is what indeed we often have recourse to in hectick Cases, when we would prevent Inflammation of any particular part; and is greatly to be relied on, where a Hectick is not already formed, but apprehended from this Cause: But, in general, it by no means seems to answer the Indications required; for, *first*, it is not to be expected, that Evacuations of
any

any Kind, shall be beneficial in a Fever, of which they are the immediate Cause; nor because Bleeding is of Service in plethorick Heats, does it therefore follow, that it will allay Heats arising from Inanition. *Secondly*, it is contrary to one great End we must always aim at in the Cure of a Hectick, which is giving Strength; the Loss of which is a Circumstance necessarily attending this Disorder, and as necessarily to be attended to. I cannot therefore think any Good can be expected from Bleeding in a hectick Fever, as such; unless it be administered as a Preventive of Inflammation, either as a Cause or a Consequence.

By *diluting* Medicines, I would be understood to mean those of the watry Tribe only, such as small Teas, Whey, Barley-Water not boiled up into an Incrassant, or otherwise mixed with Pectorals. And these in Theory seem to promise very fair, in that they give a Supply to the Waste made, and that of such cooling Particles as the Blood now needs to allay its Heat, and soften its Acrimony. But however they may be of service in common bilious Heats, they do by no means answer Difficulties: Whether they are too watshy, and so diminish

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minish Strength; or are not duly distributed; or whether they relax too much, I cannot say; this is pretty certain, they do not take off the prevailing Acrimony; nor is any Thing of this Kind to be expected from Acids, which, as they stimulate the Solids, will increase the Secretions, and so be apt to do Mischief. And as to the stronger *Mineral Acids*, if it be asked, Why that which is so powerful in allaying the Heat of putrid Fevers, should be found so prejudicial in hectical Heats? I answer, That the Benefit obtained in these Fevers does not arise so much from their tempering the Heat of the Fluids, as from their stimulating the weaken'd Solids, and thereby promoting Sweat; and hence it is, that, joined with Cordials, they become more efficacious: For if they did immediately resist and temper the Heat of the Blood, as is generally believed, I cannot see why they should be mixed with warm Medicines, or how they could do such hurt in hectick Fevers, as from all Antiquity they have been observed to do, and which it is manifest they must do, if they act by Stimulation.

Thus,

Thus as to the Intention of tempering the Heat of the Blood, we are reduc'd to cooling *Salts* and *Herbs*, and *Incrassants*: And it must be acknowledg'd, that the former may be of Service where the Strength admits of them; but it is upon the latter chiefly, that we must depend; under which I comprehend almost the whole Tribe of Consumptive Medicines, such as *Milk*, *Snails*, *Jellies*, *Flummery*, *Sago*, *Saloop*, *Broths*, *Vipers*, *Gum. Arab.* *Gum. Tragac.* *Whites of Eggs*, *Cremor Ptisanæ*, *emollient Pectorals*, &c. which, as they are of such signal Service, will deserve some Explication of their Virtues, which seem to arise, from their power to restrain the too great Mobility and Fluidity of the Blood, by which Means they not only abate the Fury of the active Parts, but also give such a Consistence to the Fluids, as will in some measure prevent their running off too fast, whereby they nourish and give Strength at the same time that they allay Heat; and so answer *both* Indications of Cure, providing not only against encreased Circulation, but also against the Encrease of Secretions. But the Misfortune is, that in many Cases the Stomach cannot receive nor digest them: and not only so, but when a

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Hectick once begins to be dangerous, and needs them most, tho' the Fluids are so active, yet the Solids lose their Strength, and have not Force sufficient, to blend and mix together such Parts as might be of Service. And as this Failure of Strength encreases, the Fluids themselves will lose all their Activity, and be so far from receiving Benefit from Incrassants, that they will require *Volatiles*, as the only Method left of keeping the Machine in Motion.

Let us now see what Remedies we are to have Recourse to, in order to quiet the too great *Activity of the Solids*. And here it is to be observ'd, that if a Hectick arises from Heat, whatsoever checks the Activity of the Blood, will also in like Manner affect that of the Solids, which depends upon it. But if the Hectick arises originally from Stimulus, we must by all means attempt to take it off; and if it is such as is not in our Power to remove, we are then to give such Remedies as serve to allay the Effects of the Stimulus, which are principally *Opiates*, and *Emollients*. There is Caution to be had in administering *Opiates*; because they have only a temporary End, to pacify the Hurry of the Spirits, to relieve a particular Symptom,

Symptom, or procure Rest ; but cannot be relied on, as to any lasting Effect. Our chief Dependance therefore must be on *Emollients*, such as are soft pectoral or oily Medicines ; which, besides their smooth lenient Qualities, do in some measure answer the Purpose of Incrassants, and are generally prescrib'd in some Shape or other, in all Hectick Fevers. And here it may be proper to observe, that the nearer they approach to Incrassants, the better they are ; because all thin watry Emollients are apt to relax too much, and increase the Secretions one way, more than they restrain them another : And agreeably to this, *Milk* has been recommended in all Ages, as the sovereign Remedy, which allays Stimulus, and strengthens at the same Time.

It now remains, that we should treat of the several Methods of Cure, made use of in the Stoppage of *encreas'd Secretions* ; which, as I have before observ'd, may be in general reduc'd either to Derivatives or Astringents. The Doctrine of *Derivatives* is founded on this Maxim, that the Encrease of one Secretion is the lessening of another ; but whoever considers how little it is in our power to encrease what Secre-

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tions we please ; and, where we can do it, how little it often proves to the Purpose ; will not rest much on this Notion, except in such Cases, where Experience warrants the Event. We should therefore carefully observe, what particular Methods of Derivation have been found, by Experience, best to answer the End we aim at ; whether *Diaphoreticks*, or *Diureticks*, or *Purges*, or *Vomits*, or *Issues*, or any other Method can most safely or surely discharge the Humours we would draw off. For whoever seeks Relief from either of these at random, without considering their respective Powers in relation to the Case in Hand, will not find Practice answer to Theory, and in most Cases will probably do more harm than good ; for Counter-Evacuations of all Kinds, if they do not relieve, will of Necessity hurt, because they add so much as they discharge to the Cause of the Distemper ; and therefore, as I say, are not to be ventur'd upon, except in such Cases where Experience warrants the Success, and even then are frequently not sufficient to stop a Flux of any Continuance. If indeed the original Cause of a Hectick Fever be in some particular Glands, which are weak, and discharge more than they ought, *Derivations*

rivations may be of Use : But if a Hectick from other Causes encreases the Secretions, this does not seem to be the proper Method of proceeding.

What then are we to expect from *Astringents* ? Where we indeed know of an Astringent, that will directly act upon the Parts affected, much good may be expected from it. But this is what in very few Cases we can pretend to, and therefore we make use rather of those that are powerful, than such as are specifical ; the Misfortune of which is, that they act generally upon other Parts, and not upon the Part affected ; or at least act more strongly upon one, than the other : the Consequence of which is, that the Disorder is encreas'd, rather than diminish'd by them ; the Part affected being still weaker, in respect of those other Parts, than it was before. But when there is a general Encrease of many Secretions, what Particulars can we trust to ? Must we not muster up all our Forces, and do our utmost ? Can the strongest Astringent do too much ? I answer, yes ; for if they constringe the Parts affected too powerfully, they screw them up to a Point they will not admit of ; and therefore, instead of strengthening, strain and

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and weaken them. Hence we see that common *vulnerary Herbs*, slight Solutions of *Vitriol*, *testaceous Powders*, &c. often do more Service, than the most powerful Astringents; and hence perhaps it is that the subastringent Quality of *Bristol-Water* takes place in this Disorder.

If then such are the Difficulties arising in this Disorder, that its main Indication of Cure, cannot well be answered by any known Method or Medicine, how valuable must that Water be, which not only Experience, but Reason also pronounces so effectual in this Case, as almost to deserve the Name of a Specifick? And that which seems to render it so effectual to the Purpose is, that it is slight in its Operation, that it cools without weakening, and astringes without overacting its Part; a Mean perhaps only attainable by the Preparations of Nature, who can fit her Instruments to her work, and seems here to have join'd these two Qualities together in such nice Proportion, as not only to counter-act the Inconveniencies arising from each of them *if single*, but also to adapt them to very surprizing Purposes. Add to this, that it is a very powerful Corrector of Acrimony, and so
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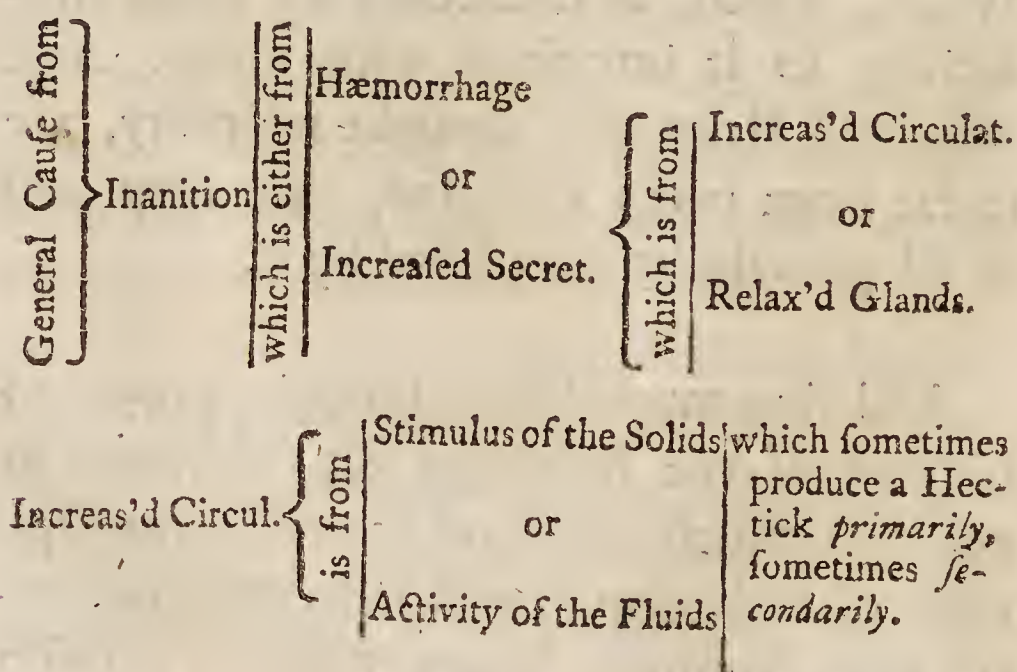
strikes at the very Root of the Disorder, destroying that, which, for the most part, is the first Occasion of it.

As therefore Incrassants answer to both Indications of *encreas'd Circulation* and *encreas'd Secretions*, by giving Consistence to the Blood, so likewise does *Bristol-Water*, but with this Difference, that it strikes at the *Cause*, whereas Incrassants seem only to allay the *Effects*; and this it does by correcting the Acrimony. If this Acrimony is loose, and circulating in the Vessels, I do not say what may be done by other Medicines, nor would I be understood to derogate from the Virtues of any of them; but where the Acrimony is fix'd, and seizes upon any particular Part, there none of them answer Expectation like *Bristol-Water*, which, as it exceeds all other Medicines, so it interferes with none: And whatever Helps are thought necessary, are so far from being excluded, that they will in all probability be assisted by it.

And thus much I have thought proper to observe of the Effects of *Bristol-Water* in general; which may serve to rectify the Opinion of such who suspect it to be little better than common Spring-water, a Notion

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favour'd by the little good done by it at a Distance, and confirm'd perhaps by many Miscarriages upon the Spot. But whoever considers that the Cases sent hither, are for the most part very difficult of Cure, and some of them quite past it, will be inclin'd to make great Allowances, and not condemn us for what we do not pretend to. But I now proceed to *Particulars*; for as *Generals* convey little or no Knowledge, and it is my Desire to give a full and satisfactory Account of these Waters, I shall follow a Hectick Fever through all its Branches, as the best Clue whereby we may unravel the whole of what is to be expected from it. The Heads, which I shall proceed upon, are laid down in the following Table, under which I have endeavour'd to comprehend Hecticks of all Denominations whatsoever.



C H A P. III.

Of HÆMORRHAGE.

LET us then begin with *Hæmorrhage*, which may cause a *Hæctick*, either *primarily*, from bare Inanition only; or *secondarily*, in that, if inward, it may end in Ulcer. But as this latter Case will come under another Head, I shall confine myself at present to such *Hæmorrhagies*, as end in *Hæctick* from Inanition only.

Of all the *Hæmorrhagies* which are apt to end in *Hæctick*, none threatens it more than *Hæmoptysis*; though I believe I may venture to say, that this is much oftner the Consequence of a *Hæctick*, than the Cause of it; for where the Circulation is quick, and the Blood acrimonious, as it is in *hæctical* Persons, any slight Accident, may make a Breach in the tender Vessels of the Lungs; whence spitting of Blood, which often ends in Consumption and *Hæctick*, and that not from the Quantity discharged, but from the prior Disposition of the Blood towards it. And this seems to be the Reason, why

Bristol-Water is so specifically good in this particular Hæmorrhage : Not that it so immediately acts upon the ruptur'd Vessel, but that it corrects the Acrimony, and abates the Hæctick, which was the Cause of such Rupture.

And the same may be said of some *Hæmorrhagies* from the Kidneys and urinary Passages, of which Acrimony is the Cause, and for which this Water is also specifically good. But as I shall be more particular as to both these Hæmorrhagies in another Place, and I look upon neither of them to be so much the Cause as the Consequence of a Hæctick ; I proceed to treat of such Hæmorrhagies as end in Hæctick chiefly from Inanition.

And here it is to be observed, that a Hæctick is not to be consider'd as a *direct*, but rather as an *accidental* Consequence : For the End of *Hæmorrhage* is for the most part *Cachexy* ; and where it is otherwise, it is generally observed to be in Fluxes of the Womb, or Intestines. Whether it is that these Bleedings, flowing from Parts remote from the Heart, (the necessary Receptacles of the more unactive Blood) this being discharg'd,

charg'd, the active becomes predominant ;— or that sharp Humours (being the frequent Occasion of these Fluxes) do in themselves dispose to Hæctick, so that there is a Tendency towards it, not only *derivatively* from the Evacuation made, but *originally* from the very same Causes which dispose to such Evacuations ;—or that Blood, discharged from these Parts, generally brings with it large Excretions from the Glands ;—which ever of these is the Case, I say a Hæctick is the frequent, tho' not the constant Consequence ; they often ending in *Cachexy* and *Dropsy*.

If we examine into a *Dysentery*, and the several Causes of it, we shall find that it chiefly arises from sharp Humours falling upon the Bowels, which irritating the Parts, throw them into strong expulsive Convulsions, exciting Pain and bloody Stools ; hence it is so rife in hot Climates, where the Heat of the Sun renders the Humours acrid, and the cold and moist Nights strike them inward ; hence also we observe it in Camps and in Prisons, especially if in damp Places, where the Food is none of the best, and the Air the very worst that can be : And hence it is, that it shews itself in Autumn,

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rather than any other Time of the Year ; when the Humours, being exalted by the foregoing Heat of Summer, are now thrown in upon the Bowels by the Evening and Morning Colds ; and that more especially, if, by indulging in cold Fruits, which are now in Plenty, you chill the Bowels, and invite Humours that Way. For the Weakness of the Part must be consider'd as contributing to the Complaint, and the Violence of it ; and is often of itself sufficient to cause it : Thus we observe it to be not only the Consequence of Diarrhæa's, but also common with such whose Bowels are either accidentally or constitutionally weak ; and that in many Cases it is the Forerunner of Death. This then being acknowledg'd, can there be any thing better adapted to both Indications of Cure than *Bristol-Water*, and what is there that we may not expect from a Medicine, which both tempers the Acrimony of the Juices, and strengthens the weak Part ? But I fear, upon Trial, it will not answer to these promising Conclusions. For, *first*, its Astringency is so slight, in comparison of many other Medicines, that it is not of Force sufficient to put a Stop to the Violence of the Flux. *Secondly*, it does not effect the great End

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we aim at, of promoting Perspiration, and throwing the Humours outwards: And besides these, there are so many other Considerations, which for the most part forbid it, that I cannot much recommend it, except in some particular Cases: But when the Violence of the Distemper is abated, and the Flux is rather continued than violent; when hectick Atrophy appears, and where inward Ulcers are apprehended, it may be given with Success, and, with the Help of other Medicines, prove of great Service. But where Schirrhous and Dropsy are the Consequence, I look upon it as hurtful.

Uterine Bleedings are so far allied to a Dysentery, as to proceed generally from the like Causes, but with this Difference, that whereas sharp Humours are the principal Source of the one, which, by falling on the Bowels, rather make them weak, than find them so; the Foundation of the other chiefly lies in the Weakness of the Part, which yields to good Blood as well as bad, and will often arise without any material Fault of it, either in Quantity or Quality. That the Womb is more peculiarly subject to Disorders arising from weak Vessels, appears, as from many other Causes, so in
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particular from its ever being in a State of alternate Dilatation and Constriction; whereby, if its Blood-Vessels either fill too fast, or restore themselves too slow, the Part is of Necessity loaded, and a Hæmorrhage will be more apt to follow this, than Plethora's of another Part; because, if we may give Credit to the most skilful Anatomists, the Vessels from which the *Menses* flow, and which serve at other Times to empty the overcharg'd Womb, are open at their Extremities, and yield to a much less Pressure than would cause a Rupture; as is requisite in other Parts, before a Hæmorrhage ensues. And hence, probably, may be deduc'd the Reason, why *Bristol-Water* is of more eminent Service in this, than in other Hæmorrhagies: For though it is of Benefit in all Hæmorrhagies proceeding from Heat and Acrimony of the Blood, and will do its Part in this, so far as it arises from this Cause, yet here it assists us still further, and that in a most material Point: For if the Fault lies in the Laxity of the Part, and *Bristol-Water* is able to constringe and strengthen that Part, (which daily Experience teaches us it is,) it strikes at the Root of the Disease, and answers the principal Indication of Cure. And accordingly

ingly we ought to distinguish between Hæ-
 morrhagies arising from Humours thrown
 upon the Part, being otherwise strong and
 in due Tone; and those which arise from
 Humours lodging there, because the Parts
 are weak: For in the first Case, tho' *Bristol-*
Water may be of Service, it by no means
 answers the chief End, which is to draw off
 the Plethora from the Womb; whereas in
 the latter it does, which is to strengthen it.
 We are to distinguish also between Hæmor-
 rhagies that are profuse, arising from Abor-
 tion, or other violent Causes, and such as
 are more moderate: In the first of which it
 can do nothing, but in the latter may an-
 swer to Expectation. But here it behoves us
 to observe, that if the Weakness of the
 Parts proceeds from Cachexy and poor
 Blood, much less is to be expected from the
 Water, than when it is a Fault of the Part
 only. For in this Case the *Causa Morbi* is
 rather encreas'd than taken off, and the
 State of the Blood is such, as will not bear
 the Remedy; not to mention the Stomach,
 which in this and many other Cases, will
 be too much chill'd by it, either to digest or
 distribute it: On the contrary, when the
 Humours are sharp and acrid, and the Body
 Hectick, its good Effects encrease upon us,

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so

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so as almost to exclude the Use of other Medicines.

And here we must not omit to mention the *Hæmorrhoids or Piles*, and the several Consequences of them, in which *Bristol-Water* is frequently of great Service: But this is a Distemper so complicated, both as to its Causes and its Cure, as would require a whole Treatise to be tolerably explicit thereon; and therefore I shall only observe in general, that if Atrophy is the Consequence, it is highly beneficial; if Cachexy, it is not so.

It must indeed be acknowledg'd, that both Dysenterick and Uterine Bleedings have also many Circumstances and Cautions attending them, which deserve Consideration; but this is a Field too large for me to enter upon, who aim only at ascertaining the general Use of *Bristol-Water*, not at comprehending all possible Cases and their Cures. And what *Quintilian* observes*, is by the change of Persons as applicable to the Physician as the Lawyer: *Si certa aliqua Via tradi in omnes materias ullo modo posset, non tam paucis contigisset: sed cum*

* Prefat. ad Lib. 7.

*infinitæ * Morborum formæ fuerint, futuræque sint, & tot Sæculis nulla reperta sit † Aegritudo, quæ esset tota alteri similis, sapiat oportet ‡ Medicus, & vigilet, & inveniat, & judicet, & Consilium à Seipso petat.*

CHAP. IV.

Of HECTICKS from encreased Circulation.

WE now proceed to treat of Hecticks from encreased Secretions; which arise either from *encreased Circulation*, or *relaxed Glands*. And first of such as proceed from *encreased Circulation*; for tho' encreas'd Circulation and encreas'd Secretions do reciprocally beget each other, and the Complication of these two together is what properly constitutes a Hectick Fever; yet, as it may conduce to the better Explication of my Subject, I shall beg leave to consider them separately.

* *Litium.* † *Causa.* ‡ *Actio.*

Increased Circulation may arise, either from Stimulus of the Solids, or Activity of the Fluids ; which mutually produce each other, and are generally so blended together, that it is hard to say, from which of the two, the Hectick properly proceeds. As therefore this cannot exactly be distinguish'd, we shall include under Hecticks from *Heat*, all we have to say of the Activity of the Fluids ; and then proceed to Hecticks from *Scurvy* and *inward Ulcers* ; under which, I think, I can best explain such as arise from Stimulus of the Solids.

It has already been observed, that a Hectick may be the Consequence of *Heat*, either *primarily*, in that it gradually causes Waste of Flesh and Strength, and robs the Blood of its unactive Parts ; or, *secondarily*, in that it is the frequent Source of Inflammation or Hæmorrhage, which end in it. But as the latter of these Cases will be explain'd under a following Head, we shall confine ourselves at present to such Hecticks as arise only from a simple Heat of Blood.

And here, as it would be endless for me to specify the many different Accidents, in-

ternal and external, which encrease the Heat of the Blood; so, I believe, it will be more to our Purpose, to omit the Consideration of the particular Causes of it, as things better known than taught; and enquire into the Manner *how* a Hectick Fever is the Consequence of Heat. That Heat relaxes the Solids, will, I believe, be easily granted me, without further Pains of proving it; as also that the Solids so relax'd will let thro' what they ought to retain, whence the Proportion of *Egesta* will be encreased. But if I can also prove, that Heat robs the Blood of its unactive Parts, there will surely be ample account made for its giving Rise to a Hectick Fever.

In order to which it will be necessary to shew, what I mean by the *unactive Parts* of the Blood, which have already been frequently mention'd, (*vid.* Chap. I.) and which I shall now endeavour to explain. The necessary Rapidity of the Blood is such, that were not our Bodies wisely defended from the Effects of it, it must destroy that which it was ordain'd to give Life to. But this is prevented, as I conceive, by its *aqueous* and *gelatinous* Parts, which I call the *unactive* Parts, in opposition to those

which are more *active* and *volatile*, and which I shall prove to be of the highest Importance.

As it manifestly appears that great Part of our Blood is *Water*, and our very Drink will teach us, how necessary it is to our Subsistence; there is no need of Words to prove it. But the *gelatinous* Substance of the Blood seems not to be so well understood, tho' equally necessary, and that in very great Quantities, to our Well-being. The Necessity of it is apparent from the abundant Provision made of it; almost all our Food, whether animal or vegetable, yielding this *Gluten* in great Plenty, especially our common Bread and Meat; not to mention our Beer, and other Liquids which abound with it. And if we further consider the great Supply made by the Lymphatics, which constantly feed the Blood with a diluted Size, as also by the Saliva, which mixes with all we eat; the Care taken of this Matter seems so great, as if we were not fit to be trusted with so weighty an Affair ourselves, lest, if it depended altogether on the Quality of what we eat or drank, we might defraud the Blood of its due. And that it is actually in great Quantities

tities ever circulating in the Vessels, we may learn from our Senses, in that we observe with our Eyes, how soon the Blood let out of the Body coagulates ; as also, if we put our Fingers into it when warm, from the slippery Feel, and Clamminess it will leave on them. And this will still further appear from hence, that if the Blood be kept stirring from the time it is let out 'till it cools, the gelatinous Parts will adhere to the Stick, and leave the more fluid Parts behind, which will never coagulate. This, therefore, together with Water, being admitted as Ingredients absolutely necessary to a healthful State of Blood, for what End is this plentiful Provision of them made, but to keep the Body cool and moist, and to counter-act the Mischiefs which must otherwise follow from the Blood's necessary Heat and Motion ? These then are properly called the *unactive* Parts of the Blood ; which, if in due Proportion, produce that Temperament in which Health consists ; if deficient, leave the Body a Prey to its own Heat, and, if they abound, are the Parent of cold Diseases. And when we consider, that neither the *aqueous* or *gelatinous* Parts, will answer the Purpose singly, and separate from each other, but that it is necessary they be properly

properly blended and mixed together, before they can serve the Ends of Circulation; then we shall the better conceive, how Heat deprives the Body of these Parts. The Means by which they are best mix'd, and kept in proper Fluidity, is Motion; which being deficient, they will separate from each other, and be difficultly secreted, more or less, according to such Deficiency; if encreased, (as it always is by Heat) they will be more intimately united together, and pass off the quicker. For as Gluten is not in its own Nature discernible, and cannot well discharge itself without the help of Water, because it cannot pass thro' the small Strainers of the Body; so whatever contributes to mix them thoroughly together, will reduce them into one uniform Fluid, better fitted for Secretion: And the more intimate this Mixture is, the more of this Gluten will continually be carried off. And accordingly, we find that the Blood in hot Constitutions is very thin and watry; not from a Separation made of the aqueous Parts from the gelatinous, as in cold Constitutions; but from a quick Consumption of that which was design'd by Nature to give a Consistence to it. And that this is the Case in Hectick Fevers, will appear from
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a Consideration of the several Symptoms and Appearances of them.

First, then, it is observed, that the Blood is exceeding florid and fluid in this Distemper. *Hectici rutilantem & difficulter coagulabilem habent Sanguinem*, says Baglivi. And * Dr. Bennet, who was a nice Observer of a Consumption, and wrote of it by desire of the College, expresses himself in the following Manner: *Corporis Succī (in Phthisi scil.) Calore immoderato attenuati, & subtiliores quam par est redditī, ad nutriendum inepti sunt. Primo, Quia balsamicā indigent Consistentiā. Secundo, Quia concitatori circulantur Motu, ita ut moram nutritioni debitam in partibus non fecerint, exinde deficientiæ necessitatem importantes. Tertio, Quia humidum depascendo, propriā conteruntur industriā.* And there are other Passages in his Book † which shew, that he was of Opinion, that Heat may thin the Humours so, as even to render the Blood itself transudable thro' the Vessels.—But this Defect of gelatinous Parts in a Hectick will appear still plainer, if we examine into the several Symptoms attending this Disorder.

* Pag. 87.

† Pag. 63. Exerc. de Sputo subdulci.

The first and principal of which is *Loss of Flesh and Strength*, both which, in great measure, depend upon the due Consistence of the Blood. For, as Water is found by Experience to transude the Vessels of the human Body; the thinner the Fluids are, the nearer they approach to the Nature of Water, and the more apt they will be to pass off; the Consequence of which is, that the Flesh cannot look plump: And that our Strength greatly depends upon the firm Consistence of the Blood, appears from the acknowledged Maxim of *Quo fibrosior sanguis eo robustior Homo*. And accordingly, the Aliment provided by Nature for Foetus's, and young Animals, is of a slimy, gelatinous Nature, in order to give some Consistence to the Fluids, which, if too thin and washy, would neither give Flesh nor Strength. Other Symptoms of a Hectick are, *Encrease of Pulse, Heat after Eating, Heat of the Palms of the Hands and Feet, Flushing of the Cheeks*, and great *Fluttering and Hurry of the Spirits*, upon the least sudden Fright or Motion: All which seem to arise from the too great Mobility and Fluidity of the Blood, and shew the Defect of such Consistence, as is proper to give a Check to both.

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There is indeed something further to be consider'd, if we would account for the Symptoms attending a Hectick in its last Stage ; such as are *Night-Sweats*, *Looseness*, and *swell'd Legs* ; which, tho' they in some measure depend on the Transudation of the Fluids, arise partly from the Relaxation of the Solids, which we have proved to be considerable in this Distemper. Thus, so long as there is *Vis Vitæ* to throw Matters outward, whenever the Warmth of the Bed encourages Perspiration, the Patient will run into profuse Sweats ; and when the Body becomes so weak, as this cannot so well be effected, this same Disposition of the Solids and Fluids will cause Humours to be extravasated, and lodge in those Parts where the Circulation is most languid, whence Looseness and swell'd Legs ; and the *Intermittent Fever*, which frequently attends this Disorder, is from the same Cause.

But here it will be necessary for me to obviate an Objection, arising from a common receiv'd Opinion, that Heat *coagulates* the Blood, which is contrary to what I assert, that it *fuses* it. This Notion is built
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upon two Experiments; the one *out of* the Body, upon observing that the Serum of the Blood, held over the Fire, coagulates; the other *in* the Body, that the Blood, in many Fevers, is exceeding fizy and thick. But neither of these seem to prove the Point for which they are alledg'd: For as to the first, it arises from the Evaporation of the watry Parts by Heat; the Serum being held in a quiescent State over the Fire; which can never be the Case in the Body, where all is in Motion, and where there can be no such Evaporation.—But if the watry Parts transude, does not this amount to the same thing, and are not the gelatinous Parts left behind? I answer, No: Because, *within* the Body, if Heat and Motion encrease, there is always a more intimate Mixture of the gelatinous and aqueous Parts together; and it is impossible for one to go off single, without carrying off much of the other with it. And this indeed has been practically allowed, by the Maintainers of this Opinion; who, not finding Experience answer to Theory, have acknowledg'd, that Heat fuses the Blood, *ordinarily*; but that, if it is *excessive*, it will coagulate it; which, if it means to express the Effects of violent external

ternal Heat on the Fluids and Solids, may be true ; but if they only mean such Heat as can be internally produced within the Blood-vessels, I cannot believe it. As to the other Observation, of the Blood being sizy in *inflammatory* Disorders, I am enclined to believe, that it does not proceed from the Heat of the Fever, but rather from the Check given to the Circulation, by the Cause from which it was at first produced ; for as certain as Heat and Motion fluidizes the gelatinous Parts of the Blood, so certain it is, that Cold, and plethorick Stagnations coagulate it.

The Cure of a simple Hectick from *Heat*, (without Inflammation, or other Hurt of the Solids) is so very easy, if taken in Time, that little else is requir'd, but Abstinence from every Thing that may encrease the Heat of the Blood ; common nourishing Diet being of itself sufficient, in most Cases, to reduce the Blood to its proper Temperament, especially if assisted by Milk, and other Ingrassants ; so that I shall not make a Merit of easy Work, and extol *Bristol-Water* for that, which may as well be effected by other Means. For here is not properly a Hectick Fever, but only a Dis-

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position towards it; and that from simple Heat only, not from Stimulus. Nevertheless, it must not be defrauded of its just Praise, being exceeding helpful to us, both as it conduces to the more speedy relieving of slight Cases, and the better Security of such as threaten Danger. And this it does, not only as a *Cooler*, but also as a *Strengthen-er* of such Parts, as are now in danger of Relaxation from the encreased Heat and Fluidity of the Blood. And this is what, perhaps, is not to be met with in any other cooling Medicines whatsoever; which are apt rather to enervate than strengthen. We may, indeed, join Astringents and Coolers together, and this may be commendable Practice; but, I believe, it is not in the Power of Art to adapt any Medicine to this Purpose so happily as Nature hath done this to our Hands.

And thus much shall suffice for Hecticks from simple *Heat*. I shall now proceed to such as arise from *Stimulus*; only observing, that as Stimulus begets active Blood, so active Blood reciprocally begets Stimulus; and so complicated are these two together, that we cannot always distinguish to which of them the Hectick does primarily belong.

belong. The Hecticks more apparently arising from Stimulus are those from *Scurvy*, and from *inward Ulcers*, to which we proceed.

C H A P. V.

Of S C U R V Y and U L C E R.

IT would exceed both the Intent and Limits of this Treatise, were I to enquire into the several Causes of so complicated a Disorder as the Scurvy is, or attempt to describe the many different Effects it has on different People, according to the Difference of the Cause, Constitution, or Part affected;—so far as it is productive of a Hectick Fever, I shall endeavour to explain it.

As the Blood must be acknowledg'd to have two Motions, the one *progressive* from the Action of the Vessels, the other *intestine* from the Activity of its component Parts; so there are two Ways, by which the Blood may be the Cause of encreas'd Circulation; *first*, as it abounds with such subtil Particles as actuate the Fluids, tho' the natural Force of the Solids be not encreas'd;

creas'd; *secondly*, as it is loaded with Salts, or other acrimonious Particles, which may not directly add to the Activity of the Fluids, but will encrease Circulation, by stimulating the Solids. The former of these has already been treated of; the latter remains now to be consider'd, as what seems to afford us the best Idea of the Disorder we are now upon.

The Scurvy, in general, is agreed to arise from an acrid *Serum*, which is occasioned either from *Ingestion* or *Retention* of such Parts as favour this Disposition of Blood. *Ingestion* may be either in Quantity or Quality, such as begets Acrimony even in those who discharge well; and thus any Constitution may, by Intemperance, be liable to this Disorder: But if those who are constitutionally inclined to it, indulge themselves this Way, they almost necessarily run into it. But, nevertheless, it is to *Retention*, chiefly, that the Scurvy is to be imputed; I mean that called so κατ' ἐξοχην, and is principally incident to those who continue long out at Sea, or live in moist stagnating Air, not friendly either to Respiration or Perspiration. The Air at Sea cannot indeed be said to be stagnating, because

cause of the Winds to which it is open, and with which it is perpetually ventilated : But if we consider the Stench of the Ship to which they are confin'd, the Impurity of the Air is perhaps greater than any we naturally meet with elsewhere ; and accordingly we see the Consequence more certain, and more fatal.

What a surprizing Variety of Cases may arise from this Cause, is hardly to be conceived by any but those who have seen them : And if we consider further, that a Scurvy may not only produce the Symptoms consequent on its original Cause, but, *ex accidenti*, almost any other Distemper ; the Case becomes so perplex'd and intricate, as hardly to admit of any Division whatsoever. But as I consider it only as it is productive of a Hectick Fever, I must endeavour to distinguish it.

The Scurvy then is to be consider'd not only as to its Cause, and as arising from *Ingestion*, or *Retention*, or both, but also according to the Constitution it meets with. Thus, for instance, if it seize on a phlegmatick Habit, in which the Secretions are not very open, it will cause a Plenitude of
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ill Humours, and Obstructions consequent thereupon ; but if the Constitution be bilious, it will have very different Consequences : For, in this case, the Blood is naturally acrimonious ; and that not from Ingestion or Retention, but rather from a too quick Discharge of those Parts which should temper its Crasis ; and if, by any Accident, this prevailing Acrimony is increased, it will follow the Bent of the Constitution, and there will be no Plenitude, but rather a hectic Atrophy. And these two Cases require very different Treatment ; the former being benefited by Evacuations, and active stimulating Medicines, the latter bearing neither of them. And this Opposition between these two Cases has been observ'd in Practice ; but no distinctive Name given to them, except that of the *hot* and the *cold* Scurvy ; which, as it is not expressive of the Thing, I shall beg leave to substitute another in its Room, which is, *Scorbutus cum Secretionibus auctis, vel diminutis*. The former of these is what I have to do with in this Place, and arises, as I have before said, from an acrid Serum, which, as it pervades all Parts, will stimulate many, and so cause a Hectick. *First*, as it barely stimulates the Solids, and thereby quickens

quickens the Circulation, and encreases the Secretions. *Secondly*, as this Stimulus may be the Cause of Inflammation or Hæmorrhage, which end in it. *Thirdly*, as the Glands are exceeding apt to be foul'd by such Blood, and thereby become liable to Inflammation, Schirrhus, Scrophula, Cancer, and all their Consequences, which may in other Parts of the Body cause a Hectick, but necessarily do so in the Lungs. But as the two latter of these Cases are to be consider'd elsewhere, I shall here confine myself to the Hectick arising from the first only.

And first, it is to be observ'd, that this is a Disorder chiefly incident to Youth, whose Vessels are more permeable, and more sensible of Stimulus, than in those of riper Years. It is sometimes Constitutional; but, for the most part, is acquir'd by hard Drinking, or high Living; or is the Consequence of such Diseases as manifestly leave the Blood full of acrid Particles; such as Small-pox, Measles, and other Fevers. The Cure of it will indeed greatly differ, according to its different Effects; but we now consider it only in its first Stage, be-

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fore the Solids have receiv'd any material Hurt. In which we must have regard both to the Acrimony of the Blood as the Cause, and the Heetick as the Effect. Were we only to strike at the *Cause*, we should have recourse to such Things as temper the Sharpness of the Humours in the Body, and such as evacuate them out of it. And even here it would be very difficult to determine, what Methods we could depend upon; because different Acrimonies require different Antidotes, and seek their Exit at different Emunctories. But as we must likewise consider the *Heetick*, the Difficulty will be still greater; because the Fever will be apt to encrease the Stimulus faster than we can allay it, and will not bear the necessary Evacuations. If then *Bristol-Water* shall be found to reconcile these Contradictions together, it will justly claim a Preference to all other Medicines whatsoever. We can temper Heat, and soften Acrimony, by such Medicines as are cooling and incrassating, tho' perhaps by none more powerfully than by *Bristol-Water*; whose Excellency it is, that it not only stifles it, but expels it at the same Time: Which, that we may the better conceive,

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we must here recollect its diuretick Quality; by which it checks the Passage of watry Parts through the Skin, and disposes them rather to pass thro' the Kidneys: For as Perspiration and Urine are the two great Secretions of Nature, by which she discharges these watry Parts, the Decrease of one will be the Encrease of the other. And accordingly we find by Experience, that it passes with most People this Way in large Quantities; and with it undoubtedly carries off many saline and stimulating Particles, which would otherwise remain in the Body. But here a Question may arise, Why the like is not to be expected from *other* Diureticks? To which I answer, *First*, that in this State of Blood those of the cooling and watry Tribe will pass off other ways; at least, will not pass in so great Proportion by Urine as this will: *Secondly*, that the Kidnies will not bear other Diureticks, of the contrary Kind, so well as this; the Consequence of which is, they will not operate so certainly, nor so effectually: For it is a peculiar Property of *Bristol-Water* to strengthen the Kidney as it passes through it; which no other Diuretick proper in this Disorder will do, but rather the con-

trary. There are indeed Hecticks which are call'd Scorbutick, and yet do not meet with expected Relief. But whoever considers how nearly allied the Scurvy is to many stubborn Foulnesses of the Blood; and how impossible it is to distinguish, in many Cases, what is Scurvy, or other more inveterate Humour, will not wonder at some Miscarriages. This is certain, that in the most stubborn Cases, *Bristol-Water* will always be a good Assistant at least; and sometimes cure even beyond Expectation: And I know not of any Case, in which I can more cordially recommend the Use of this Water, than in Dispositions to a Hectick from a Scorbutick Cause. And when I consider how common this Disorder is among young Gentlemen especially, how fatal are the Consequences of it, and how certain the Cure, if not already far gone, I am mov'd to speak of it in higher Terms than is decent for me, who will be said to be interested in the Commendation of it. But, as I must ever believe those who labour under this Complaint to be much more interested to hear, than I to speak of it, I shall, for their Sakes, venture to assure them, that there is not, in the whole *materia*

teria medica, any Thing so well adapted to their Case as this is; whether contracted from intense Study and sedentary Life, from Free-living, or from unhappy Constitution; and that they will probably meet with nothing elsewhere, that will cure them so agreeably, or so effectually, as *Bristol-Water*.

Of U L C E R.

Let us now proceed to the Hectick occasion'd by *Ulcer*. There are two Ways by which an Ulcer may cause a Hectick; *First*, by the Discharge of Matter which it yields; *Secondly*, by the Stimulus which it gives. The one is for the most part the Case of large outward Ulcers, the other the Effect of inward ones. The Manner how a Hectick is the Consequence of inward Ulcers has already been explain'd; how it proceeds from outward ones, appears plainly from the Drain made, and is properly reducible to Hectick from encreas'd Secretions: But I here choose to consider both together.

What then are the Indications of Cure? And this is what I would gladly settle; but

then I must explain the Nature and Difference of Ulcers in general, from the Cause occasioning them, from the Part affected, and other Considerations too complicated for me to enter upon, and much of it such as would be foreign to my Purpose. I shall therefore content myself with enquiring, in general, what may be expected from *Bristol-Water*, when a Hectick is the Consequence of them. First, then, in large Discharges where it proceeds from the Drain made, it keeps the Body from wasting, and gives better Room for Restoratives; in such Ulcers as stimulate, it gives a Check to the Encrease of Circulation, it prevents further Inflammations, and, in some measure, mitigates the Effects of those already begun: Nay, further, by softening the Acrimony of the Blood, it may possibly dispose them to heal. But as this is seldom or never the Case, and inward Ulcers are not ordinarily to be cur'd by *Bristol-Water*, they must be acknowledg'd, in general, to be above the Power of it. The bad Effects of Ulcers are indeed greatly mitigated by it, but I cannot easily believe it heals them; much less do I think that it has any cleansing Quality, whereby it washes away the
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Foulness of such Ulcers, and acts on them in the same Manner as on outward Sores. In Ulcers of the Lungs and Kidneys it is greatly recommended ; but I forbear speaking of its Merit in these Particulars at present, and only observe in general, that I do not believe Ulcers of either of these Parts to be so common as is generally imagined ; which will appear more plain from what follows. And thus I have gone thro' all the Species of Hætick from *encreased Secretions*, so far as they arise from *encreased Circulation*. I now proceed to *encreased Secretions* from *relax'd Glands* ; and first of a *Diabetes*.

C H A P.

C H A P. VI.

Of the D I A B E T E S.

AS there is no Sort of Hectick so remarkably benefited by *Bristol-Water*, as the *Diabetes*, we shall be the more particular in our Enquiries into the Cause of it; to find out, if possible, what it is which makes it so effectual. I have before observ'd, that all Hecticks are caused by some *Drain*; and that the general Indication of Cure is the Stoppage of such Drain; which is effected by taking away the Causes of it. And this is so manifestly true of a Diabetes, that it never was disputed. The only Difficulty therefore is, to find out the Cause of this immoderate Flux of Urine, and settle our Indications accordingly. In which Enquiry, I shall not take upon me to give an Account of every different Opinion which has been started concerning it, but rather confine myself to what I think the principal Point in Dispute, *viz.* Whether this Distemper proceeds from a Fault in the Blood, or a Fault in the Kidney?

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Antiquity is altogether for the latter ; and Dr. *Willis* is the first Writer that I know of, who is an Advocate for the former ; who supposes, that the Blood being fused, or turn'd like Milk into Curds and Whey, the watry Part seeks its Exit thro' the Kidneys, and so causes a Diabetes. And hence it is, says he, that Rhenish Wine, Cyder, and such like acid Liquors, cause this Distemper ; *viz.* by curdling the Blood. The Weakness of the Part may possibly, he thinks, contribute something to the Disease, but he is apprehensive, if this was considerable, Blood, rather than Water, must pass this Way ; and therefore directs his Cure entirely to the amending the Crasis of the Blood ; asserting, that Astringents are contrary both to Reason and Experience ; and by no Means to be depended on. In answer to which I beg leave to observe ; *First*, that our Author has given no one Proof, that such Separation of the Blood is possible, whilst circulating in the Vessels. *Secondly*, that if so slight Acids caused such Separation, would not this Disorder be more frequent ? Or could we in any case safely use the stronger Acids ? *Thirdly*, supposing the Blood thus separated, he assigns

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no Reason, why the watry Part should run thro' the Kidneys only, and not thro' other Emunctories. — Is it not more agreeable to Experience, to believe it might pass off at the Skin? Or if Nature could not effect this, that it would lodge in the Abdomen, swell the Legs, and tend to a Dropsy? — *Fourthly*, it does not appear that Acids are the principal Cause of this Distemper: Nay once, I think, I saw it brought upon a Patient by the frequent and continued Use of *Sal Absynth.* a Salt which he proposes for the preventing this Curdling of the Blood. I need not take any further Pains to confute one whose Philosophy is now exploded, and whose great Abilities claim no better Character, in this Age of Certainty and Demonstration, than that he was *Egregius Hypothesium Artifex*.

But Physick is now become clear and demonstrable, and, as we are told, stands built upon the known Laws of Motion and Mechanicks. A renown'd Writer of this Class, has the following Words in support of a Diabetes being a Disease of the Blood.
* “ The evident Cause of this Distemper is

* Dr. James Keill of Animal Secretion, p. 70.

“ an habitual Drinking of strong Liquors ;
“ and the more spirituous they are, the
“ sooner and more violently they bring
“ it.—Hence it comes to pass in process
“ of Time, that the Serum, or thin Part of
“ the Blood, contains a large Proportion of
“ a spirituous Fluid, or that Part of the
“ Serum which should be Water, is for
“ the most part Spirit. Now the Salts of
“ the Urine, or Blood, will not dissolve in
“ a vinous Spirit ; that is, the Particles of
“ which the Salts consist are more strongly
“ attracted by one another, than they are
“ by such a Fluid, as by Experiment ap-
“ pears ; and therefore the Quantity of Salts
“ in the Blood will be daily increas’d, and
“ circulating thro’ the capillary Vessels,
“ must irritate the fine Fibres, and cause
“ little Pains and Twitchings all over the
“ Body, (which he before says are Symp-
“ toms preceding a Diabetes.) But when
“ the Serum is full of these Salts, the Dis-
“ tance between them and the Globules of
“ Blood will be less, and consequently
“ they will attract the Globules of the
“ Blood more strongly than the Globules
“ attract one another ; and the Globules,
“ or red Part of the Blood, will be dissolv’d
“ and diffused thro’ the Serum of the Blood.

“ And this again is confirmed by Experi-
 “ ments; for nothing does render the red
 “ Part of the Blood so fluid, and keep it
 “ more from coagulating when drawn in a
 “ Cup, than urinous Salts and Spirits.
 “ When the red Part of the Blood is thus
 “ dissolv’d, and united to its Serum, it will
 “ with the Serum be carried off thro’ the
 “ Glands of the Kidnies; and being united
 “ to their Salts, will alter their Figures and
 “ Properties, as Litharge and Corall do the
 “ Salts of Vinegar, giving them a sweet
 “ Taste.” Thus from this one simple *un-*
doubted Principle of Attraction, and three
 known Experiments, the whole Mystery is
 explained.

But it is to be observed in the *first Place*,
 that it by no Means appears, that drinking
 of spirituous Liquors is the most general and
 evident Cause of this Distemper; much less
 that the more spirituous they are, the sooner
 they bring it: For it has not only been be-
 fore observed, that acid Liquors, such as
 Cyder and small Wines, are a common
 Cause of it; but it also appears from daily
 Experience, that Small-beer, Water itself,
 or any other watshy Liquor, taken in too
 great Quantities, may be the Cause of this
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Disorder. This may, indeed, be more likely to happen, if the Digestion is impaired by frequent Dram-drinking; but Drams alone are rather productive of other Distempers; else surely the Diabetes would be more frequent: So that no certain Effect is to be gather'd from the Blood thus impregnated with Spirit, as our Author supposes.

Secondly, if it were possible that spirituous Liquors could so saturate the Blood with Spirit, as not to leave aqueous Moisture sufficient to take up its Salts; but that Part of the Serum, which should be Water, becomes for the most part Spirit; should we not hence apprehend worse Consequences? How could the Blood circulate without aqueous Moisture? How could the necessary Secretions be carried on? How would the tender Fibres perform their respective Offices? How would the Brain bear it? Does not every Drunkard shew us, that Spirit is of a transmeable Nature, and easily carried off? Are little wandring Pains and Twitchings of the Tendons the only Mischief that would ensue? Or indeed are they usually reckoned among the fore-running Signs of a Diabetes? But, *thirdly*, supposing there is Spirit enough in the Blood to hinder the Salts from dissolving,

and the Experiment shall take Place ; could we not easily supply the Body with aqueous Moisture, sufficient to overbalance the ill Effects of the Spirit ? and would not the Cure consist in that which by Experience is found hurtful, *viz.* the plentiful drinking of small watry Liquors ?

But to proceed to his second Experiment, which, is the fusing of the red Part of the Blood by means of urinous Salts, which makes the Blood become thin as Water, and transmeable thro' the Kidnies. Did this Gentleman ever see Blood turned to Water, by means of urinous Salts ? And if it was so, what determines the Passage of it thro' the Kidnies only ? Not the Salt ; for that has alter'd its Qualities, and become sweet : And he brings a third Experiment to prove why it must be so, *viz.* “ Because a red
“ Substance out of the Body makes an acid
“ Salt sweet ; therefore a red Substance in
“ the Body shall make an urinous Salt
“ sweet.” I need not surely dwell any longer on such Reasoning as this, but shall only observe, that this Gentleman was a Physician of great Note in the Mathematical Way, and profess'd to build Physick on the clear and demonstrable Principles of that Science ;

Science; but stands an Instance, among many others, that these *Philomaths* are no wiser than other Folks; tho' they think they have a most piercing Eye, and can with Certainty declare,

Quod latet arcana non enarrabile Fibrâ.

As therefore I am by no means satisfied with either of these Accounts, I must beg Leave to proceed in my own Way, and declare what appears to me to be the Case. And *First*, I think it is evident, that a *Diabetes* is a Disease of the Kidney: For when any Glands discharge more than they ought, and this Discharge is of different Quality from that which is natural, then are such Glands said to be diseased; and this is apparently the Case of the Kidnies in a *Diabetes*. In what Manner they are diseased will appear, in some measure, from the following Considerations; *first*, from the most evident Causes of it; *secondly*, from the Analogy it bears to other Accidents of the Body; *thirdly*, from the Cure.

The most common and evident Cause of a *Diabetes* is, the immoderate Use of such Things, which cause Urine to flow plentifully

fully thro' the Kidnies : Thus *Cyder, cool Tankards, Punch*, which provoke Urine, and are drank in great Quantities, are a frequent Cause of this Disorder ; and that more especially if the Constitution is such, as to have its Discharges in this Way naturally large. — If drank at a Time of Year when Perspiration is less. — At a Time of Life, when the Tone of the Part begins to be impair'd. — Or when the Kidnies are already weaken'd, thro' Intemperance, Disease, or other Accident. These Considerations, I say, incline us to think, that a *Relaxation* of the secretory Ducts of the Kidnies is the Cause of this Disorder : And this is somewhat confirm'd, in that * most Authors speak of it as arising wholly from an undue Use of diuretick and forcing Medicines. — † Some have observ'd it consequent upon a Suppression of Urine — ‡ As also an undue Use of Opium ; of both which a *Relaxation* is the Consequence.

And there seems still farther Reason to believe this, if we consider, *Secondly*, the Analogy it bears to other colliquative Dis-

* Hildanus Cent. 5. Obs. 53. — Tulpius, Lib. 2. Cap. 46.

† Forestus, Lib. 24. Obs. 4. — Harris, Obs. 3. de Diabete.

‡ Lister Exerc. de Diabete,

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charges ; which we all agree, proceed in great measure, from the Relaxation and Weakness of the secreting Glands ; and which are accompanied, more or less, with the same hectical Symptoms : And these Discharges are as much altered, both in Quantity and Quality, from what is naturally secreted, as in a Diabetes, tho' not in the same Manner.

Thirdly, The Cure of this Disorder has from all Antiquity, consisted chiefly in such Things as were suppos'd to astringe and strengthen the Kidneys, without any Regard to the Crasis of the Blood ; except that by Milk, and other nutritive Incrassants, they endeavour'd to lower the Hectick Fever, and, by some cooling Medicines, allay the Thirst. Dr. *Willis* does indeed say, that both Reason and Experience declare against Astringents, and that few or none are cured by this Method ; but as the present Practice declares for them, and he was not able to substitute a better in their Room, they still remain as Evidence, that this Notion of a *Relaxation*, was not only the current Opinion before his Time, but is so still ; and it is also evident, that many have been benefited by Astringents. From all which I

conclude, that where there is a diabetical Flow of Urine, there the Kidneys are relax'd.

But I very much doubt whether this is the whole of the Affair; for if the Kidneys only were in Fault; it would surely be a more frequent Distemper. The free Indulgence in all kind of Liquors—the common Accidents attending Stone and Gravel—old Age—and other incidental Weaknesses of these Parts, would render it almost impossible to escape it, if Relaxation was the only Cause: Nor can I well conceive, if this were the Case, how some People should drink such Quantities of Liquor thro' the Kidneys, without any Tendency to Diabetes; whilst others, who are guilty of much lesser Irregularities this Way, shall be seiz'd with it.

And therefore I think a Relaxation of the Kidneys not the *Whole* of this Disorder, but that something farther is necessary towards constituting a Diabetes, which I believe to be Acrimony of Blood. Whether this Acrimony be of a peculiar Nature; or whether it only arises from a Suppression of Perspiration, high Feeding, or other common

mon scorbutick Causes, I do not take upon me to determine; but this I believe, that as Acrimony occasions other Gleet, so this also; which in some measure appears from the following Observations: * That different Kinds of Fevers will sometimes end in it.—That it has been seen to follow upon Mortifications from an inward Cause.—† That People labouring under this Distemper are subject to Spasms, Cramps, and hot fiery Eruptions of divers Kinds.—That if any Inflammation arises in the fleshy Parts, it is generally very difficult to manage, and will often mortify.—Add to this, that the very highest Inflammation the human Body is subject to, *viz.* the Carbuncle, is sometimes an Attendant on this Disorder.

* Αἰτία δὲ, ὃξέων νόσων τις, ἀπέσκηψεν ἐς τόδε,
καὶ ἐν κρίσι κρύβδην τὸ κακόνδεσ ἐγκατέλιπον αἱ νόσοι.

Aretæus de Diab.

† Observavi in pluribus huic Morbo per intervalla obnoxiis, quod paulo antequam in Urinæ Profluvium inciderint, in toto corpore partium nervearum dolores vagos, & corrugationes, modo cum stupore, & fornicationis sensu, modo cum crebris spasmodis, ac tendinum subsultibus, aliisque spirituum perturbationibus & inquietudinibus, paterentur. *Willis de Diab.*

I am very sensible, that all Disorders consequent upon a Diabetes, may be accounted for from the Alteration made, either in the Fluids or Solids, by the Distemper itself; but as many of them have been observ'd to precede a Diabetes, as well as follow from it; and there can be no Proof given, that when these Mischiefs are the Consequence, they do not arise from an original Fault in the Blood, it is reasonable to think Acrimony is one great Cause of a Diabetes: And, indeed, I hardly ever have seen a Person labouring under this Disorder, but, upon Enquiry, I had reason to think he was highly scorbutick, before this Misfortune came upon him; and however drinking of small Liquors may have been the *causa προκαταρκτική*, an acrimonious State of Blood has appeared to me to have been the *causa προηγμένη* of his Distemper.

And this Account is still farther probable, if we believe what is reported of the Serpent *Dipsas*, that its Bite throws a Man into a Diabetes. I cannot find any mention of a Diabetes in *Topsell*, who has collected both from Ancients and Moderns all that he could learn of this, and all other
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Kind of Serpents ; nor does * *Lucan* say any Thing of it, tho' he describes the Symptoms of a Man bit by this Serpent *Dipsas*. They only say, that the Thirst is intolerable, and that they will drink till they burst. Now if this excessive drinking ever ends in Diabetes, it seems to me to be a Case in Point ; first, an Acrimony causing Thirst, then a Diabetes from small Liquors drank to assuage that Thirst. We conclude then, that the Relaxation of the Kidney is the *immediate Cause* of a Diabetes ; but that the more *remote Cause* (that without which it would not have been) is Acrimony ; and that both together are the adequate Cause.

And, indeed, the Cure of this Distemper from *Bristol-Water* speaks as much ; which seems to act, not only by strengthening the relax'd Part, but also at the same Time correcting the Acrimony of the Blood, and so strikes at the two joint Causes of it. *Astringent Medicines* may sometimes be of Service in this Distemper, but *Bristol-Water* greatly exceeds them, in that it will not only cure sooner and surer than these will, but also when they absolutely fail ; and this

* *Lucan's* Pharsal. Lib. 9, 434.

for two Reasons. First, as they seem to be an Astringent suited to the Part: Secondly, as they not only answer this Intention of strengthening, but also another of equal Import, and without which the Cure is not easily effected.

It appears from outward Applications, that the milder Astringents will often be of Service, where the rougher would do Hurt: So that the most powerful are not always the most effectual, unless adapted to the Part. And there are two Things which seem requisite in every astringent Medicine, that is of Service in this Disorder; First, that it arrive at the Part affected; Secondly, that it is adapted to it. As it is not every Astringent will do either of these, we must make Choice of such as are most likely; and in this seems to be the Excellence of *Bristol-Water*, which, tho' a slight Astringent, yet as it seeks its Exit thro' the Kidneys, acts more specifically upon the Part than any other known Medicine, and may perhaps be peculiarly adapted to it. But whether this be so or no, this is certain, that it corrects Acrimony, and by so doing disposes the weaken'd Part to a Cure, which, in all Probability, it cou'd not otherwise

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receive. Hence we see, why none of the Medicines ordinarily made use of, will have the desired Effect, be they either Incrasants or Astringents; because they do not correct Acrimony. How far they may be made to do it, by a prudent blending of them together with anti-acrid Medicines, I cannot say: Let it be tried.

This Distemper has been called *Hydrops ad Matulam*; intimating that, as in a Dropsy, the watry Parts of the Blood are separated from it, and lodge in the Abdomen, so here is the same Thing, only with this Difference, that the Water so separated is carried off by Urine. If they only mean, that there is in both Cases a Separation of the watry Parts, I could easily agree with them. But if they infer from hence, they are alike either in their Causes or their Cure, I can see no manner of Reason for the Comparison made. *Qui ad pauca respiciunt, de facili pronuntiant.* A Rebuke I wish was not quite so applicable to Physick as it is.

And thus have I endeavoured to explain the true Cause of a Diabetes, and the Indications of Cure answer'd by *Bristol-Water*; which

which, as it is agreeable to, and explicative of, its Virtues in other Cases, carries with it a great Probability of Truth; and farther than this I do not pretend to. I cannot conclude this Chapter without mentioning a Caution or two which may be of Use.

In scorbutick Habits of Body, where the Blood is acrimonious, and there is Thirst, not to indulge too freely in Punch, Cyder, or especially Small-Beer. In warmer Climates small Liquors will perspire away; but in this they are very apt to run off thro' the Kidneys, especially if drank at a Time of Life when the Pores begin to be less open, and Perspiration abates, and there is a scorbutick Habit from this Cause.

If there happens to be an unusual Flow of Urine, to be upon your Guard. Many have had a Diabetes and have not known it; nor is it always discoverable by the Taste. I have seen those who have manifestly wasted from a Flow of Water, without any Sweetness discoverable in it, and have been cured at this Place; which I do not directly call a Diabetes, but rather an Inclination towards it, which, if not put a Stop to, will end in it. Others there are,
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who have made sweet Water probably for many Months, but have been so incurious as not to taste it, and so have remained ignorant of their Case.

This Water takes Effect in some sooner, in some later; it will sometimes do its Work in three Weeks, without help of any other Medicines; sometimes it will not do it in as many Months; and yet, by Care and Perseverance, make a perfect Cure at last. The longer the Disorder has been upon a Person before he applies to the Water, it is generally the more difficult to remedy. That this Distemper does not always meet with a Cure, is very true; and for this Reason it is that *Bristol-Water* shares the Fate of the *Bark*, and other capital Medicines, and has been abused accordingly. But if thro' Length of Time, Weakness of Body, or bad Constitution, this Distemper gets a Head, and is above the Power of Medicine, it is no Reflection upon the *Bristol-Water* that it cannot cure it. This is certain, that the specifick Virtue of this Water, in this Distemper, is so well known, that it exhibits the strongest Instance of the medicinal Qualities of it, and its Difference from other Waters, not

mineral ; because no Water will do what this does, nor will this do it at a Distance.

C H A P. VII.

Of GLEETS.

WHAT next offers to be consider'd, under the Head of encreased Secretions from relax'd Glands, are *Gleets*. And first of the *Fluor Muliebris*, than which perhaps there is not a more complicated Disease, whether it be considered in its Causes, or in its Effects. The *first*, and most general *Cause* of it is, the Abundance of phlegmatick or watry Humours, apt more especially to lodge in Parts remote from the Heart, where the Circulation is languid, and the Vessels numerous and lax, and which so lodging discharge themselves in different Consistence and Colour, and cause no small Variety of Cases. *Secondly*, If from any Foulness of Blood, or Sharpness of Humours, or other Cause, the Glands of these Parts happen to be inflamed, the Consequence of such Inflammation is, that when it goes off, it necessarily leaves such Glands weak and loaded ; which, if they do not soon recover their Tone, be-

become gleety, and will also produce different Effects, according to the Constitution it meets with, and end either in Cachexy or Hætick. *Thirdly*, The same Consequences will follow, if these Parts are weakened from any other Cause, such as natural Weakness of the Part, any Hurt from Cold, or Strain, or other Accidents, which are innumerable. And accordingly we find that the *Cure* of this Disorder varies with the *Causes*; for in the *first* of these Cases it is expedient to prescribe Vomits, Purges, Stomachicks, Chalybeates, Bitters, Volatiles, warm Emmenagogues, &c. in such Order and Proportion as the Case requires: In the *second* Case, we dare use nothing which agitates the Blood, or stimulates the Solids; but must have recourse to Incrassants, and to softening sedative Medicines: In the *third* and last Place, our whole Care is to strengthen the Part by Balsams, and warm Chalybeates, if the Constitution be moist and cold; by Alum, Bark, Vitriol, &c. if the Humours be sharp; and by relieving the Part affected by every Method that can derive Humours from within outwards.

Let us now see what is to be expected from *Bristol-Water* in these several Cases before distinguished. In the *first* Case, where the Blood is poor, and the Part loaded, I conceive it to be of no Service at all; for how should such a Habit of Body be improv'd by a Water, which rather binds *in* Humours than throws them *out*? And how should it strengthen a Part, of which it naturally encreases the Load? But in the *second* Case I believe it may be of great Benefit; *first*, as it tempers the Sharpness of the Humours, and makes them less stimulating; *secondly*, as it strengthens the Part, preventing Inflammation, and remedying the Effects of it. But even here there will be great Difference of Success, in Proportion as the Constitution is hot or cold, and according as the Disposition tends to a Hectick or Cachexy; which latter is the most common Consequence; because Women are not so subject to a Hectick as Men, having neither so active Blood, nor so active Solids, as Men in general have. But it is to be observ'd here, that Cases are frequently complicated,—that the Body will seem cachectick, when the Humours offending are exceeding sharp. And in
such

such-like Appearances, *Bristol-Water* must not be despised; because it may, in Conjunction with other Medicines, be of great Service; and that not because of sharp Humours *only*, but if we consider that Weakness of the Part is a necessary *Concomitant*, so far as *Bristol-Water* can help this Symptom, so far it may be used, and no further. And this brings me to consider of the *third* Difference laid down, where the Weakness of the Part is chiefly in Fault. And here *Bristol-Water* may be consider'd as a Strengtheners of the Part, but not such as can be trusted to in great Hurts, such as Abortions, Strains, &c. Where the Blood is warm and active, it does great Good; but where it is cold and languid, it cannot be relied upon.

What has been said is, I think, sufficient to explain the Disorders of the *Glands* in general, at least such as end in Drain. *First* then, they are either loaded by Quantity; or, *Secondly*, they are inflamed or obstructed by some ill Quality of the Humours passing, which, if resolved, necessarily leave the Part weak; if not, end in Schirrhus, Ulcer, &c. *Thirdly*, they, like all other Parts of the Body, are subject to Weakness,

ness, either constitutional or acquired. Each of these three therefore will either end in Drain, or somewhat worse. The first is the most easily remedied; next to that the second, if it ends safely in Drain; last of all, the third. And if we consider that any two or more of these may be complicated together, we shall then have some tolerable Idea of the great Variety of these Disorders, and why they are often of so stubborn a Nature.

Simple Gonorrhæa's in Men stand distinguished from those in Women, in that they proceed only from Weakness of the Part, and are never occasioned by *Humours* pressing that Way, but by *Strain*, or other acquir'd Weakness of the Glands. Whence the sole Indication of Cure (unless in ill Habits of the Body, which make the Cure complicate,) is strengthening the Part; which as it is no easy Matter to do, so I cannot recommend *Bristol-Water* as a Thing to be depended on. But when such Cases prove stubborn, and cannot be cured by the common Methods; I know not of any Thing more adviseable to add to other Medicines than *Bristol-Water*. It *may* better a scorbutick Habit of Body; it will

most certainly contribute to strengthen the Part; and by its gentle gradual Manner of Operation, may, *perhaps*, act more friendly and effectually than that which seems more powerful. And accordingly we observe in these Cases, that even regular Diet, gentle Riding, chearful Company, which all serve to keep up the Strength, are sometimes more to be relied on, than the most promising Medicines.

In *Venereal Gonorrhæa's*, where the Virulence is entirely purged off, and a Gleet left, it generally yields to Turpentine Medicines; if it continues, or is encreased by repeated Acts of Venery, (without Infection) it is reducible to a simple Gleet, and *Bristol-Water* will be of equal Service.

And thus much shall suffice to have said on those two great Sources of a Hæctick, *Encreased Circulation*, and *Encreased Secretion*. Were I to treat particularly of Diarrhæa's, profuse Sweats, and other colliquative Discharges, I could do little more than repeat what has already been said. I shall therefore only observe in general, that where the Drain is great, and the Hæctick certain, this Waters answers two main Indi-

dications of Cure, of resisting the Activity of the Blood, and strengthening the weak Part ; except that in Diarrhæa's some of the same Objections will lie against it, as I have before observ'd in the Case of Dysentery. But when the Evacuation is such as the Body can bear, and the Constitution not hectical, it can only act as a Strengthenener. Nor will it even do this, where there is the least Tendency to Cachexy. The one appears from its Virtues in a Diabetes ; what is said of Gleets, may serve as an Instance of the other. What now remains is, to explain its Virtues in Disorders of the *urinary Passages*, and in the *Phthisis Pulmonaria* : And first, of the urinary Passages.

C H A P.

C H A P. VIII.

*Of Disorders of the U R I N A R Y
P A S S A G E S.*

IF this Water acts specifically upon any one Part more than another, it is on the *Urinary Passages*, to which it is particularly friendly, in almost every Complaint to which they are subject.

In *nephritick Cases* it may be of Service, barely as a Diuretick ; but if we consider that it also corrects Acrimony, allays Heat, and strengthens the Part, there is hardly any Indication of Cure that may not be answer'd by it. In the Fit, indeed, I have sometimes seen it not of sufficient Force to pass ; in which Case it will rather do Harm than Good : But out of it this rarely happens ; and where it does pass, it cools, it cleanses, and strengthens at one and the same Time. Some may perhaps think, that as an Astringent it will contradict the general Intention of Cure, which is to keep the Passages open ; but if they will consider in how relax'd a State these Parts generally

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are, from the Strain and Spasms they undergo in the passing of Gravel, and how the usual Regimen, which is opening and laxative in this Case, does rather encrease than remedy this Inconvenience, will be inclined to lend an Ear to *Fred. Hofman*, who observes: *Quod toni renalis nimia resolutio, morborum qui renes occupant, potissima causa, & origo est*—*Quâ de causâ*, says he, *temperata astringentia & roborantia, in calculo tam præservando, quam curando, palmam cæteris præripiunt*; and refers you to a Dissertation of *Heucherus, de Astringentium usu in Calculo*, Med. rat. Syst. Pars I. Sect. ii. Cap. 8. And of all Astringents surely *Bristol-Water* promises the fairest, because it is a Diuretick, and serves to cleanse, as well as strengthen, at the same time; which I believe no other Astringent does.

In the *Stone* (properly so called) it is of singular Service, in that it softens the Urine, allays Heat, prevents the fretting of the Parts, and may serve to wash away fresh Concretions of fabulous Matter, and, with the Use of other Medicines, be made subservient to many good Purposes.

But its chief Excellence lies in Cases where neither *Stone* or *Gravel* is already form'd, but only apprehended ; whether it be used as a Preservative for those who never have had it, or as a Preventive to such as have had some small Intimations of it. For here, as the Kidneys are supposed to be tolerably sound, a prudent Use of this Water will answer the End requir'd ; whereas it must be acknowledged, that when the urinary Passages have receiv'd any material Hurt, it is not so easy to remedy, because of the constant Motion they are in, and the no less constant Flow of Water through them : So that notwithstanding the best of Remedies, much Patience and Perseverance is necessary ; nay more, a Temper of Mind willing to persist in that which is right, tho' no great Benefit ensues, and above the Temptation of great and uncertain Promises.

As to all those Disorders which generally attend upon the Stone and Gravel, either as a Cause, or a Consequence, such as *Inflammation*, *Hæmorrhage*, *Ulcer*, &c. I did indeed intend to enlarge upon them in this Place ; but as the Indications answer'd by *Bristol-Water* in the Cure of them,

plainly appears from what has been said, it seems altogether needless. One Thing I shall observe, which I think of no small Moment, which is, that I do not think Ulcers of these Parts so frequent as is generally imagined. If at any time a Patient voids Matter resembling *Pus*, with his Urine, it is immediately pronounced to be an Ulcer of the Kidneys; whereas, from what I have observ'd in several Cases sent down here, I have Reason to think it is no more than a Gleet, to which not only the *Urethra*, but also the *Glands of the Bladder*, *Ureters*, and of the whole *Urinary Passage* are subject: And of this I could bring some very convincing Proofs; but as my Design in this Treatise does not admit of relating particular Cases, and as this Matter may be certainly known by Dissections, of which I have not yet had an Opportunity, I leave it to the Examination of those that have, and so conclude this Chapter.

C H A P. IX.

Of the PHTHISIS PULMONARIA.

THE next and last Thing which I have to consider is the *Phthisis Pulmonaria*; a Disease the most frequent of any that is sent here, and the most difficult to manage. The general Opinion concerning this Distemper is, that it begins with Inflammation, which, not being discussed in time, suppurates, and so ends in Ulcer; and this by two different Ways; *first*, in the natural Method, as any other Inflammation may; *secondly*, by Hæmorrhage; in which Case, as the extravasated Blood cannot be so perfectly expectorated, but some of it will remain behind; this, they say, in so moist and warm a Place, is very apt to be concocted into Pus, and so corrupt the neighbouring tender Parts. Hence we are told, by Authors both ancient and modern, that no Part of the Body is so subject to Suppuration as the Lungs; and most Writers not only describe a Phthisis as arising from Ulcer of the Lungs, but make *Ulcus Pulmonum* a synonymous Term for it.

And

And yet from a very careful Examination of this Matter, both from what I have experienc'd in myself, and observ'd in others, I find nothing but what may very fairly be accounted for from a *Catarrh*, and the natural Consequences of it.

By *Catarrh*, I understand all Defluxions of any Kind, which fall upon the Glands of the Lungs, be they either *simple* or *compound*; *i. e.* whether they offend in Quantity only overloading them, or in Quality also inflaming and obstructing them. The Consequence of a *simple Catarrh* from Quantity only, is a greater Discharge than is natural; which, with common Care, usually abates soon, and is cleared off, because the Glands are not so hurt, but they will easily recover their natural Tone and Use.

But if the Humours are acrimonious, and so circumstanced as not only to overcharge the Glands, but also to stimulate and inflame them, then will they not so easily recover themselves, but be so weaken'd as not to yield their wonted Moisture, nor answer their natural Use; whence they become

become gleety, and instead of secreting that which was requisite, drain the Body of its most nutritive Juices. And this I take to be the true Cause of a Consumption from phthifical Spittle, which begins with a Cough, and ends in Gleet, and is, of all other Species of Consumption, the most common, as it is the most natural Consequence of a stubborn Catarrh.

But if this *Catarrh* be yet of a more malignant Nature, and such as tends not only to stimulate the Glands, but also to corrode, or any ways destroy their discerning Power: Then follows either *Scrophula* or *Schirrhus*, or *encysted Matter*, or *stony Concretions*, &c. All which may indeed end in Ulcer, but will cause a Consumption whether they do so or no.

And as I have great Reason to think, that from one or other of these Accidents attending a *Catarrh*, a *Phthisis* is for the most Part occasioned; I must beg leave to observe *first*, how very subject these Parts are to *Catarrh*; how often, and how easily they are affected upon every slight Cold caught, and that perhaps more than any other Glands of the Body. *Secondly*, that
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the common procatactick Causes of this Disorder are not properly inflammatory, but rather such as cause Defluxions on these Parts. Hence we see why Winter-Weather, and moist Air, Anxieties of the Mind, Night-Studies, and every Thing that checks Perspiration, are the Forerunners of this Disorder ;——because they naturally throw Humours upon the Part.—Why any natural Weakness of the Lungs, from Constitution, or Mal-formation, makes the Case more dangerous ;——and *lastly*, Why these Accidents are so fatal to scorbutick Habits of Body ; such as are not perfectly cleansed of the Remains of Small-Pox, Measles, or other eruptive Fevers ; or such as have any Acrimony of Blood of other Kind——because all these contribute to the greater Obstruction and Hurt of the *Glands*. And do not we in general observe, that the Beginning of a Phthisis is from some Cold caught, which gradually growing worse and worse, encreases by degrees into this Distemper ; plainly shewing, that it arises from one and the same Cause ? Does it not begin for the most part with a Cough, and phlegmatick Spittle, manifestly glandular ? Have we any Symptoms answering to Inflammation tending to Suppuration ? And

is it not much longer in coming to *Pus* than is possible, in a Part so liable to Suppuration as this is said to be? And when it is arrived at it, does it destroy so soon as one would imagine by the Quantity discharged, and the Part affected? These are Questions not easily to be answered upon the Supposition of an Ulcer; and accordingly Physicians will often declare, that the Lungs are not ulcerated, even in dangerous Cases, where this puriform Spittle appears in great Quantities; whereby they tacitly confess what I am contending for.

There are indeed some Appearances which give Countenance to the receiv'd Opinion, and were probably the first Foundation of it; for as this Disorder often begins with Heat and Inflammation, and after that, a Discharge of Matter follows, resembling *Pus*, it was natural enough to imagine, that it was a Suppuration consequent on a preceding Inflammation. And some Countenance has been given to this Opinion, by the late Doctrine of * *Tubercles*; whereby it is insinuated, that these Inflammations are very small, and consequent-

* Vid. *Morton's Phthisiologia.*

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ly not productive of violent Symptoms; yet, by being frequently repeated, evade the Art of Physic, and at Length exulcerate. By which they seem not only to account for the Length of Time to which this Distemper will run, before it destroys a Patient, but also for the gradual Encrease of it; and promise themselves a Cure by incarning, as they hope, an Ulcer, which is but very small in the Beginning, and if taken in time, remediable.

But these Mistakes arise for want of a Distinction, between an Inflammation of the *Blood-Vessels*, and an Inflammation of the *Glands*. In all Defluxions which are acrimonious, there is indeed an Inflammation, but very different from that which is commonly called so, and which, if not resolved, ends in Suppuration: For tho' the Glands may suppurate as well as other Parts, yet in Inflammations that are resolvable, the Consequence is very different. If a common Inflammation of the Blood-vessels is resolv'd, it is a Cure, and no material Hurt remains; but if the Glands be inflamed, tho' the Inflammation is resolved, the Part is left weak, and there follows a Gleet, and the Cure is not effected; and as this Gleet
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yields Matter so very like *Pus*, that it is sometimes impossible to distinguish it from it, we have been deceiv'd by Appearances, and apprehended a Suppuration where there is none. Whereas if we had observed the Difference between *glandular* and *vascular* Inflammations, as also considered the Nature of some other gleety Discharges more apparent to Sight, we might not have made this Mistake. I will instance only in a weeping Eye, where the Matter discharg'd and lying in the Corner of it, is so like *Pus*, as no one can discern the Difference: And that this has been the Case in Consumptions, has been prov'd by Dissections, where, though great Quantities of this Matter has been discharged, no Ulcer has been found.

Another Reason which has inclin'd People to suspect that an Ulcer is the most general Cause of a Phthisis, has been the Appearance of Blood frequently intermix'd with phthifical Spittle, which they think must proceed from some ulcerous *solutio continui*; as also, that this Disorder sometimes begins with Hæmorrhage; or if it begins with Cough, a Hæmorrhage will often ensue, which tends to Ulcer; because the

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extravasated Blood not being perfectly expectorated, is apt to concoct into *Pus*, according to the known Aphorism of *Hippocrates*, Ἐξ αἵματος πύσσει Πύρ πύσσις.

In order to obviate this Objection, it will be necessary to distinguish Hæmorrhagies (as I have before done Inflammations) into those that are *vascular*, and those which are *glandular*. By vascular Hæmorrhagies, I mean such as proceed from the Rupture of any Blood-vessel: By glandular, such as arise from tumified or inflamed Glands. When Glands are inflamed, they may bleed either by admitting Blood into Vessels which do not ordinarily carry any, whence there is a Rupture of such Vessels; or by letting Blood thro' the secretory Ducts, without any Rupture of the Vessels at all; in both which Cases the Hæmorrhage proceeds properly from the Glands. And if we consider the great Mobility and Fluidity of the Blood in consumptive Cases, and that these Glands of the Lungs are more particularly affected, it is no wonder if the Blood will frequently ouze through them; so that here is no Proof of an Ulcer, nor is Ulcer the ordinary Consequence of such Hæmorrhage; for we generally observe, that as
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the Case grows worse, the Patient ceases to spit Blood, and brings up a large Quantity of foul phthifical Spittle, without the least Tincture of it; and which proceeds not from Ulcer, but from the encreased Discharge of these weak and disabled Glands.

As to *vascular Hæmorrhagies* which end in Consumption, the Opinion of an Ulcer is very natural, and very ancient: And as it is here acknowledged that the Bleeding proceeds from the Blood-vessels, and not from the Glands, it may not so easily be conceived how, in this Case, there is a Catarrh: But as these Hæmorrhagies for the most part arise from the same common Causes as a Catarrh, *viz.* Acrimony of Blood, and Weakness of the Part, and are generally the Consequence of a prior hectic Disposition; the Phthisis which follows, is not perhaps to be imputed to the Bleeding, so much as to the Causes which first occasioned it, which tend to Catarrh, and will certainly end in it, if no Stop is put to them: And it is observable, that where these Hæmorrhagies arise from other Causes, there the Apprehensions of a Phthisis lessen in Proportion, which would not be the Case, if extravasated Blood was the Cause; and

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and as we observe many to recover of this Disorder, and to have no Signs of *Pus*, after repeated Extravasations and Lodgments of Blood upon these Parts, I should rather, I say, impute the Phthisis sometimes consequent upon it, to a prior hectic Disposition, than to this Cause; and *Hippocrates's* Aphorism will stand good, tho' not in the Sense generally put upon it; Ἐξ αἵματος πτύσσει Πύον πτύσσει: Phthifical Spittle (not *Pus*) is the Consequence of spitting Blood. Was the extravasated Blood concocted into *Pus*, as has been imagined, the Tragedy surely must begin sooner, and rage higher than it ordinarily does, and somewhat like an Empyema must ensue; for I cannot well conceive an Ulcer once formed not to spread in a Part, which of all others is supposed most subject to Suppuration.

I would not be understood by what I have said, to exclude Ulcers from having any Share in causing a Phthisis; for as in other Parts of the Body they certainly have this Tendency, so likewise have they in the Lungs; and it is no uncommon Thing to meet with a Consumption from this Cause; and not only so, but we acknowledge Ulcer to be the frequent Consequence of
other

other Causes. But what we contend for is, that this Distemper is not ordinarily occasion'd by Ulcer; and however it may end in it, yet the foul phthifical Spittle, which has been taken for Matter proceeding from Ulcer, is no more than a gleety Running of the Glands, from acrimonious Humours thrown upon them.

And thus having endeavour'd to prove, that a Catarrh is the most general Cause of a Consumption, if what I have said be conclusive, the *Seat* of this Distemper is in the Glands of the Lungs; the *Cause* of it, acrimonious Defluxions thrown upon them. If indeed the Lungs are exceeding weak and tender, any Defluxion, not acrimonious, may have ill Consequences; but in general no Phthisis ensues from a simple Catarrh without Acrimony. And this in some measure appears from the violent Defluxions we observe on these Parts, in some asthmatical People, who have great Discharges from these Glands; but because their Humours are not acrid, or rather because there is no hectic Acrimony, (for other Acrimony there may be) there is no Danger of a Phthisis.

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Acrimony of Blood therefore is essential to the Phthisis Pulmonaria, The *causa sine qua non*, that without which it cannot well be ; and this not every Acrimony, but such only as quickens the Circulation, encreases the Secretions, and disposes to a Hectick. Acrimony *cum secretionibus diminutis*, as I have before observ'd, begets Diseases of another Kind ; but *cum secretionibus auctis*, it ends in Consumption. And here we may see the Reason why this Distemper is so rife in this Country ; insomuch that with some it has obtained the Name of *Morbus Anglicus* ; we being very subject to scorbutick Acrimonies from our free manner of living, and to catching Cold from the Variableness of our Weather ; so that I believe the Cough is heard no where so much as in *England*, of which a Consumption is the Consequence.

And as this will shew us the Nature of Acrimony in general, and how very hurtful it is to those Glands on which it shall happen to fall ; so will it let us into the proper Indications of Cure, which are to correct
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the Acrimony, and relieve the Part affected.

The first of these is generally attempted with soft pectoral Drinks, with cooling Salts, with Milk and other Incrassants, which in many Cases are of great Service, tho' I will be bold to say, that none of them all, answer the Indication like *Bristol-Water*, which corrects Acrimony very powerfully, and is more effectual in this Case than all other Medicines put together.

The next Thing we must attend to, is to relieve the Part affected. It is a known Maxim in Physick, that the Encrease of one Secretion is the lessening of another ; but this will teach us very little, if we do not also know what particular Discharges are most effectual in every particular Case. Some have conceiv'd great Benefit from Issues and Blisters ; others from well-timed Evacuations of all Sorts ; and Dr. *Bennet*, who was an experienc'd Man in this Distemper, is very zealous for diaphoretick Methods.

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Prolixioris operis esset historias medendi deploratæ fere sortis tabidos consignare, quorum curationes consummarunt, sudores artificiose præstiti. In posterum ut frequentius imperentur optarim, & ut sensuum placitis, auscultare dignetur medicorum hæsitantium turba. Exerc. 30. p. 78.

Which as it seems agreeable to the known *Consensus* between the Lungs and the Skin, may be well worth considering; as indeed all other Methods of Derivation are; nor is *Bristol-Water* to be defrauded of the Part it bears in answering this Indication, inasmuch as it is a diuretick, and may possibly contribute greatly to the Relief of the Lungs by this Means. But the main Difficulty is still behind: To correct Acrimony, and to derive it from within outwards, is no such difficult Task, provided we have Strength to work upon: But here arises, for the most part, a hectick Fever, which so confounds the natural Indications of Cure, that without great Regard had to the proper Management of it, nothing we can do, becomes effectual; and herein consists the Difficulty of curing a Consumption. What this Hectick is, and how it is to be
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managed, I have already declar'd ; and that I know of nothing so effectual towards the Cure of it as *Bristol-Water*. And thus shall I finish what I have to say, on the Distempers which are more especially benefited by it.



PART III.

*Of the Nature of BRISTOL-WATER,
so far as it is discoverable by Ex-
periments.*

I Now proceed to examine the Water itself, whose Spring rises within the Channel of the River *Avon*, on the North-side, about ten Feet above Low-water Mark, at the Bottom of a very high craggy Rock, through which the River runs, and by which it is bounded on both Sides.

This Rock runs through the whole Country round about, on both Sides of the River, and consists of a hard Marble Stone, of different Shades, from a dusky red, to a light grey. The chief Properties of it are as follows.

I do not pretend to describe the Nature of every different *Stratum* that may be found in this Rock, only say in general, that it is hard as Marble, and receives a
Polish

Polish like Marble; as may be seen in several Chimney-pieces made of it, particularly that in the Pump-room, which is beautifully variegated. Add to this, that like all other Marbles it burns into Limestone, which is particularly good in its Kind, and serves the Town in a double Capacity, both for Stone and for Mortar. And yet in one respect it does not agree with other Marbles; all which are said to raise an Effervescence more or less with *aqua fortis*; but this upon trial did not answer to this Characteristick, whole, or in Powder; and a small Piece which I kept steep'd in it for ten Days, was as hard as when first put in.

Any two Pieces of this Rock being rubb'd against each other, send forth a strong sulphureous Smell; and if you strike any of these Stones with a Hammer, they strike Fire, and send forth the same sulphureous Smell; and yet upon reducing a Piece of this Stone to Powder, and throwing it upon *Sal. Nitr.* in Fusion over the Fire in a Crucible, not one Spark of Sulphur appear'd.

This Stone when broke, appears full of bright luminous Sparks, which glister in
the

the Sun, and which some have taken for metallick Particles; but if so, I should think they would yield to *aqua fortis*, and therefore believe them to be Spar. Several Parts of this Rock, especially where the Fissures are, seem tinged with ferrugineous Earth; but the Metal which abounds most in these Parts, is Lead.

The Fissures of this Rock, are full of sparry Chrystallizations of different Colours, some few clear as Chrystal, but for the most Part opaque and dusky *. (Dr. *Woodward* says, these different Colours are owing to the different Proportions of ferreous Corpuscles uniting with the chrystalline in the Concretion.) Others there are of a fine deep black Water. Some of the best of them receive a pretty good Polish, but not to be compared with those Chrystals, which generally are sold under the Name of *Bristol-Stones*; though *Camden* says, that they vie with Diamonds for transparency, and yield not to them in any respect save Hardness, and that it is the great Plenty of them that lessens their true Value †.

* Natural History of Fossils, p. 160.

† *Camden's Britannia*—County of *Somerset*, towards the End, p. 75. Edit. 1695.

The current Opinion of this Rock being a Lime-stone, has given Occasion to a Notion, that the Water flowing from it is a Kind of Lime-water; and some who have never seen the Place, and know very well that Quick-lime is made of Chalk, have imagined this Rock to be Chalk also; and that the Spring is nothing more than a clear transparent Water, replete with the Virtues of such Chalk; which latter Opinion is confuted by what I have said of the Rock already: And the little Ground there is for the former, will appear from what follows. And thus much shall suffice to say of the Rock, which if I believed communicated any Virtue to the Water, might merit a farther Examination.

The Water as it comes from the Spring, is clear as the finest Spring-Water, rising up with Force from beneath upwards, and sending forth, as is computed, about 40 Gallons in a Minute: It appears very brisk and sparkling in the Glass, and is so very full of small Air-bubbles, that the Water receives, as it were, a whitish Hue from them.

In

In Taste and Smell, it differs not from other Water, unless that it is peculiarly soft and agreeable ; though it is found upon Experiment to be really a hard Water, not lathering kindly with Soap, nor taking so full a Tincture of Tea, as Rain-Water will.

Its Warmth raises the Mercury in *Fahrenheit's* Thermometer to 76, and never varies upon any fair Trial I have seen made with it. My Lord *Macclesfield* made the Experiment daily, for several Weeks together in 1744, and never found the Variation of above one Degree, tho' all the Company imagined it to be very different at different Times, and accordingly it has been thought that the Water is not so warm *now* as it formerly was ; which Opinion cannot be absolutely confuted, because our Fore-fathers had not the several Degrees of Heat adjusted by a Thermometer, as we now have. Ever since Thermometers have been in Use, the Heat has been the same ; and *Guidot* speaks of it in his Time, as a Water whose Warmth *ultra*
* *teporis gradum non assurgebat* : Nay,

* *Guidot de Thermis Bristolicis.*

says

says further—*In morbis istis in quibus infimus caloris gradus requiritur thermas has præ cæteris, necessarias existimo.*

One peculiar Property this Water has above any other Water known, that it carries pure and uncorrupt round the whole World, and never receives a Taint in any Alteration of Climate, or Length of Time.

And it is further to be observ'd, that no Change of Weather or Seasons affects this Spring, but that the Water flows always the same, in Quantity and Quality, at all Times of the Year ; nor is there any sensible Alteration has ever been observ'd in it, when fresh from the Pump, except when it is foul'd by the Tide.—And thus much for those Qualities of *Bristol-Water* which are most obvious and apparent ; we now proceed to those which are discoverable by Experiments.

The common Method of examining a *mineral Water* has been, either by various Mixtures made with it as it comes from the Spring, or by analysing it (as they call it) into its compounding Parts.

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Thus if any *vitriolick Salt* is in the Water, it is discoverable by the Mixture of *Galls, Oak-leaves, Green Tea, Balaustine Flowers*, and other astringent Plants, which will turn it of a purple black.

If any *Acid* is predominant, it will shew itself by the same Properties other *Acids* do, such as turning *Syrup of Violets* red, fermenting with *Alkali's*, and not with *Acids*.

If *Alkali* prevails, then on the contrary it will appear, by turning green with *Syrup of Violets*, fermenting with *Acids*, and not with *Alkali's*; as also by turning a Solution of *corrosive Sublimate* yellow. And this is the chief of what is discoverable by Mixtures made with mineral Waters at the Spring.

The Trials made with *Bristol-Water* are as follows.

With *Galls* I could perceive no Colour struck, any more than with common Water, tho' I put half a Scruple of the Powder into a half-pint Glass, and let it stand 24 Hours;

Hours ; nor is any Thing of this kind produced by other astringent Plants.

With volatile *Alkali's*, such as *Spir. Corn. Cerv. Spir. Sal. Armen.* no Fermentation at all, nor with any other fix'd *Alkali*, except that *Ol. Tart. per deliq.* caused a whitish Cloud to arise in the Water ; but as this is common to almost all mineral Waters as well as this, nothing can be collected from it. *Omnes ferè Aq. Minerales*, says *Hofman*, *cum Ol. Tart. per deliq. obscurantur & lactescunt ob salis communis vel terræ calcariae connubium.*—So that this Water is no Acid.

With the stronger Acids, such as *Ol. Vitrioli*, a brisk Fermentation was raised, but the weaker ones, made little or no Alteration, except that they seem'd to destroy the little Air-bubbles, sparkling up and down in the Glass, and made the Water appear more clear and transparent. This Experiment declares the Water to be of an alkaline Nature ; which was farther confirm'd, in that it turn'd of a greenish Colour, by the Admixture of *Syrup of Violets*, tho' with *corrosive Sublimate* it did not turn yellow.

But before we proceed any further, it may be proper to consider what we are about, and inform ourselves what Knowledge is to be gain'd by these Experiments; and first, as to the Infusion of *Galls*.

Though the Way of trying mineral Waters by the Change of Colours that *Galls* produce in them (says Mr. *Boyle*) be useful, and recommended by being easy, cheap, and expeditious; yet I do not take it to be either of that *Extent*, or of that *Certainty*, that 'tis vulgarly presumed to be of; for as its main Use, is only to discover whether the Water has any Thing in it of a ferrugineous Nature, it cannot be very extensive, because there are divers metalline Ores, and other mineral Bodies not participating of *Iron*, which will not be discoverable this Way, and yet may strongly impregnate the Water: As for Instance, says he, to try whether if *Arsenick* were mingled with Water, *Galls* would discover it by producing with it a dark Colour, I put some of the Powder of them, into a Decoction of *Arsenick*, but did not perceive that it gave the Liquor any deeper Colour than it would have done to common Water.

And

And as the *Extent* of this Experiment is not very great, so neither, says he, do I find the Informations it gives to be so *certain* as they are presumed; for I found upon trial purposely made, that another Body of a metalline Nature, and that did not partake of *Iron*, would, with Infusion of *Galls*, afford a very dark Colour, that might easily, among ordinary Beholders, pass for the Colour produced by a martial Water; and I somewhat doubt whether all Liquors impregnated with *Iron*, will be discovered to be so, by the Colour they afford *Galls*; for I have sometimes made such a Liquor, with no mineral Substance in it save *Steel* or *Iron*; but I did not find it would turn the Infusion of *Galls* either blackish, or purple. *Boyle's Memoirs for the Nat. Hist. of Mineral Waters.*

Moreover, it is very well known, that many mineral Waters, which give this Tincture with *Galls* at the Spring-head, will not give it after standing some small Time in the open Air; which shews that this *vitriolick Salt*, supposed to be discovered this Way, is not of a fixed Nature, but volatile; nor can this Salt be said to

be acid, because, upon Experiment, these very Waters are all found to be alkaline; but if the Idea we are to have of a *vitriolick Salt* has nothing in it, either acid or fixed, how can we call it Vitriol? Much less can we argue its Effects upon the Human Body to be the same as Vitriol, and practice upon such precarious Principles.

Again, there are many *mineral Waters* which turn Colour with *Galls* of so very different Natures, that were we to judge of the Virtues of them from this Experiment, we should know but very little about them. And others there are, which answer to this Trial, of no Virtues at all, but rather unwholesome: So that no great Matter is to be learnt from this Experiment, though a capital one, and that on which great Strefs has been laid.

In the next Place, we will consider what Knowledge is to be obtained from the several Mixtures of *Acids* and *Alkali's*. And *first*, we will suppose that we discover an Alkali by these Trials: How does it appear what Sort of *Alkali* it is, earthy or saline, fixed or volatile, from this Experiment? And yet all these are of very different

ferent Virtues. And if we allow this *Alkali* to be saline and fixed, such as may be made visible to the Eye, and extracted from the Water, how can we tell what other Substances may be in Conjunction with it, and how its Virtues may be affected by such Conjunction? It is well known that *Iron* itself will ferment with *Acids*, and yet its Virtues are not from *Alkali*, but rather from its opposite, an acid vitriolick Salt. And if you take a little *Alum*, and dissolve it in Water, you will find, upon Experiment, that it turns green with *Syrup of Violets*; which we shall be told, arises from an alkaline Earth contained in it; but will any Body say, that *Alum-Water* is not an *Acid*. Again, are not the Virtues of most Waters far beyond the Power of any alkaline Salt? At least that small Quantity of it which is discovered upon Evaporation? And has not *Hofman* proved, that all mineral Waters are impregnated with such Salt, more or less? Now what is common to *all*, cannot be the distinguishing Mark of any *one*.

And as to *Acids*, they are liable to the same Objections. These Experiments can inform us only in general, that an *Acid*
is

is in the Water, but not specify what particular *Acid* it is, and consequently convey no Knowledge, only that as there is a greater Variety of *Acids* than *Alkali's*, there is still greater Uncertainty in determining Particulars; and if this could be known, we should still be ignorant what Share this Acid might have in giving Virtue to the Water; whether in whole, or in Part, or indeed at all: And if in Part only, a very little Observation will teach us, that one and the same *Acid* may have very different Effects, as it is in Conjunction with different Substances. Thus we are told by the Chymists, that *Alum*, *Sulphur*, *Vitriol*, have all three one and the same *Acid*, and yet they are of very different Virtues.

I am not ignorant that other Experiments have been made, with Mixtures with the Water as it comes from the Spring; such as with a Solution of *Silver* in *Aq. Fort.* which, if there is any *Sea-salt* in it, turns white and milky; if any *Sulphur* black. But as all these labour under the same Objections as the former, I need not take up my Reader's Time in examining particularly into them; only conclude, that if all these Experiments are so limited and

uncer-

uncertain, the Knowledge conveyed by them must be very slight and superficial; and can by no means answer, to that exact and satisfactory Enquiry, which is generally profess'd by those that make them.

But although no great Knowledge is to be obtained, from any Mixtures made with the Water at the Spring, yet surely, some useful Discoveries may be expected, from the *Analysis* of the Water into its compound-
ing Parts. Now the Method of *Analysis* is this; *first*, to draw off the Water by Distillation, or open Evaporation, and then examine the *Residuum*. If the Water is drawn off by Distillation, it may be examined by various Mixtures as above: But this, to very little Purpose, because, after it has undergone the Fire, there is an Alteration made in its Properties, so that all Experiments labour under greater Uncertainties than before; nor do I know of any Body that has in the Examination of this, or any other Water, laid any great Stress upon them, as made in this Manner; but they are extremely minute and particular as to the *Residuum*. Now the *Residuum* is examined two different Ways; *first*, in the gross, as it is found remaining; *second-
U ly,*

ly, by separating the saline from the earthy Parts, and examining them distinctly.

They who profess to have gone through this Method of Experiment, with the greatest Exactness, do by no Means agree, either as to the Quantity, or Quality, of the *Residuum* found in *Bristol-Water*.

Dr. *Guidot* says, one Gallon of it contains 50 Grains of *Residuum*.—Dr. *Wyn-ter* says it contains 36 only.—Dr. *Keir* 34.—Mr. *Shebbeare* 56. All which Differences may indeed be accounted for, it being almost impossible they should agree exactly, by Reason of the different Vessels used, the different Times spent in the Evaporation, and the different Dryness to which the *Residuum* may have been reduced; tho' from 34 to 56 is a greater Difference than one can well believe these Accidents should occasion.

The Experiments made upon the *Residuum*, they are pretty well agreed in; and they are the same, that were made upon the Water before; viz. *Acids* being pour'd upon it, there arises an Effervescence; but no such Thing appears upon the
Affusion

Affusion of *Alkali's*, either volatile or fixed—That it turns green with *Syrup of Violets*, and has all the Signs of *Alkali*, except that it does not turn yellow, with a Solution of corrosive Sublimate.

But when they come to separate this *Residuum*, by Filtration, into its saline and earthy Parts, they differ more than ever. Dr. *Guidot* says, the saline Parts are to the earthy, as 1 to 4.—Dr. *Wynter*, as 1 to 5.—Dr. *Keir*, as 11 to 15.—Mr. *Shebbeare*, as 11 to 13: And each has his particular Opinion, as to the Nature of this Salt and Earth. Dr. *Guidot* says, that in the *Residuum* of *Bristol-Water*, he discovers chiefly, a *ferrugineous Earth*, with a small Proportion of *Lapis Calcarius*, and some nitro-sulphureous Salt.—Dr. *Wynter* thinks that it consists principally of *Chalk*, *Lapis Calcarius* and *Calaminaris*, and some lixivial Salt.—Dr. *Keir*, that it is a Compound of Nitre and *Sea-salt*, intimately united with a *calcarious Earth*. —Mr. *Shebbeare*, that it consists of Alum and Lime stone, or rather Quick-lime flaked.

And thus being left under great Uncertainties as to these Matters, it may be expected that I should carefully examine into these several Experiments; and, upon an accurate and exact Survey of every Particular, endeavour, as much as in me lies, to set Things right: But as I despair of discovering any Thing more, than those which have gone before me, and think that very little is to be learnt from this Method of *Analysis*, I must beg leave to be excused; at the same Time giving my Reasons, why I think all this great Labour and Pains, little better than a needless Piece of Curiosity.

The Principles upon which the Virtue of any mineral Water depend, must be either of a volatile, or fixed Nature, or a Mixture of both. If of a volatile Nature, it is very plain it cannot be discovered by this Method of *Analysis*; because in the Evaporation, previous to this Kind of Examination, it must necessarily exhale and fly off. And that this is the Case as to most of them, appears, in that if they stand some Time in the open Air, or are warmed

ed by the Fire, they lose their Virtues, and soon become vapid and of no Effect.

Neither do I think the Virtues of a mineral Water discoverable this Way, if they consist of that which is fixed: For as it is the Nature of Fire, to unite some Particles which were not joined together before, and disjoin others that were, we cannot make any certain Judgment; whether what is found in the *Residuum*, did exist under the same Form, in the Water before Evaporation. In some Springs indeed, where there is a large Quantity of fixed Salt, as in *Scarborough* and *Cheltenham* Waters, this Method of Examination may take place; but then it is to be observed, that these Salts are miscible again with Water, and in some Degree imitate the Virtues of the original Spring, which gives us some Proof that they are not much altered in the Process; but when the Salt procurable by this Means, gives no Virtue to other Water mixed with it, what are we to conclude then? And as to the Earth, which remains after Evaporation, it is certain it has undergone some new Combination, because it will not mix and incorporate with the Water as before: Not to mention that

all Spring-Water yields Salt and Earth, upon Evaporation, and that generally more in Quantity than mineral Waters.

If the Virtues of any Water depend upon that which is of a mix'd Nature, partly volatile, and partly fixed, it is plain the same Objections will hold as above: And tho' some of the fixed Parts should be discover'd, yet so long as we cannot tell how they may be altered or affected, with being in Conjunction with the volatile, we can never reap any Thing certain from this Method of *Analysis*.

Lastly, I cannot think the Quantity of the *Residuum* found in *Bristol-Water* sufficient, to expect any medicinal Virtues from it. Fifty-six Grains to a Gallon, which is the very highest Computation, and the greatest Part of this *Earth*, must leave but a very small Proportion of *Salt*, to impregnate so great a Quantity of Water, and such as cannot be of any Significance, because no natural Salt whatsoever, in that Proportion, is so; nor do we find, upon re-mixing it with Water, it has any Effect at all: And indeed, did the Virtues of any Water depend upon the *Residuum*, or any Thing of
a fixed

a fixed Nature, it would be very easy for us to imitate them, and exhibit something of like Virtues; which as we have never been able to do in any Shape, it is better to confess our Ignorance, than pretend to that which we cannot attain to.

But although it must be allowed that mineral Waters are so nicely compounded, that it is impossible, by the most accurate Analysis, to discover the exact Proportion of the several Ingredients, on which their Virtues depend; yet (it will be said) these Experiments may not altogether be useless: For if we can hereby obtain the Knowledge of the fixed Parts, though we cannot say how they are improved by the volatile, yet we may in some measure guess at the Basis. As for Instance, *Scarborough*, and other purgative Waters, do by this Method of Analysis, discover the Salt on which their Virtues principally depend: And though we cannot say the whole Virtue of the Water resides in this Salt only, yet is it the principal Basis of all that is to be expected from it. I answer, that I am for evaporating every mineral Water whatsoever; but when it manifestly appears, upon repeated Trials, that the Quantity of the

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Residuum is insignificant, and such as re-mixed with Water imparts no Virtue to it, or, upon Experiment made, gives no In-sight at all into the Virtues of the Water, but on the contrary we have great Reason to think, that it is something of a volatile Nature which gives Efficacy to it, to what Purpose is it to seek where nothing is to be found, and busy ourselves in extracting Sun-beams out of Cucumbers*? We have been told, that the End of making Experiments upon *mineral Waters*, is either to give us a more comprehensive View, of the true Nature and Virtues of them, or to enable us to imitate the like. Now if neither of these Ends can be obtain'd this Way with any Certainty, and much Pains is required in the Search,

Cur tam ridiculum, tam carè, Prodigus, emam?

Are then Experiments of no Use? And is all that has been writ, and said, of *mineral Waters* examined by them, to be laid aside? I think not: All that I am concerned for, is to see People so eager after them. They are of more Use in some

* Vid. *Gulliver's Travels*.

Waters than in others ; as for Instance, such whose Virtues depend upon a fixed Salt ; or if upon any Thing volatile, such as have it plainly discoverable in them, as some *chalybeate* Waters ; and in all others, though they do not *positively* prove what is in the Water, they may *negatively* what is not. Thus, for instance, when I see *Bristol-Water* give no Tincture to *Galls*, it is a negative Proof that that *volatile Chalybeate*, which appears in many other Waters, is not in this. And here I shall take Occasion to examine into the Opinion which is so generally receiv'd concerning this Water being a *Lime-water* ; and endeavour, by a few Experiments, to prove that it is not : Which may serve, by way of Specimen, to shew what I mean by negative Experiments, *viz.* such as do not indeed inform us what the Water is, but may serve to rectify Mistakes, and tell us what it is not.

It has been generally believ'd, that this Water is a natural *Lime-water* : An Opinion which might perhaps first arise from the Rock, out of which it springs, being called a *Lime-stone*, and be favoured by some imagined Resemblance in their Virtues ; nay, some have gone so far as to say,

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its Warmth arises from *Quick-lime*, in the Act of flaking. This Notion in regard to the Warmth of a *mineral Water*, however new it may appear, is as old as *Democritus*, and has been confuted long ago, by saying that *Quick-lime* is an artificial, not a natural Body, and such as was never found in the Bowels of the Earth. Nor do I conceive it possible for it to continue in this State, under Ground, if it was; because of the natural Moisture of the Earth, with which it would flake, and turn into a dead *Calx*. But we will suppose that it is there; and moreover, that Nature deals it out in proper Quantities, as it is wanted, for the proper Heat and Imprægnation of the Water; what is to become of it after it has done its Work, and where shall we find Room for this encreasing Quantity of dead *Calx*? How is it that the Water appears so clear and transparent, and not foul'd by the Admixture of *Quick-lime*, as Water generally is, till it has stood some Time and settled, which it cannot do in a running Spring?

But as this Opinion of the Warmth of the Water, is not held by many who yet believe it to be a *Lime-water*, we proceed

ceed to Experiments ; though as I have no Notion of a *Lime-water* without *Quick-lime*, what is already said, may be urged against this latter Opinion, as well as the former.

Both *Lime-water*, and *Bristol-water*, turn green with *Syrup of Violets*, and both Waters ferment with the stronger *Acids*, tho' in *Lime-water*, the Effervescence raised, is not so visible to the Eye as in *Bristol-Water*. Both these Waters therefore, have what is called an *Alkali* in them ; and I really thought once, there was some very great Resemblance between them ; for upon making these Experiments, I found that *Lime-water*, upon the Admixture of *Oyl of Vitriol*, (about a Tea-spoonful to a Wine-Glass) raised a considerable Heat ; so that upon stirring it with my Finger, I could not well bear the Heat felt at the Bottom of the Glass : And this I found did the same with *Bristol Water*, both warm from the Spring, and cold, after it had stood some Days. I then made trial of it upon several different Springs of common Water, as also upon Rain-water, and found it to be exactly the same : So that however there may possibly be some small Difference in

the Degree of Heat generated, if nicely examined, no Conclusion can be drawn from this Experiment, for the Similitude between these two Waters.

Lime-water, upon standing exposed to the open Air for a small Time, throws up a glassy *Scum* to the Top, which if you take off, it is soon covered with it again; but no such Appearance is to be found in *Bristol-Water*.

Lime-water, incorporates readily with *Oil*, so that it will turn into a Kind of Consistence like Butter; but *Bristol-Water*, refuses all Admixture with *Oil*, the same as common Water.

No *Salt*, of any Kind, is to be extracted from *Lime-water*, as the *Chymists* observe; but *Bristol-Water* exhibits some *Salt* upon Evaporation, as appears by Experiment.

No Air-bubbles observable in *Lime-water*, as in *Bristol-Water*.

A So-

A Solution of corrosive Sublimate turns of a deep yellow with *Lime-water*, with *Bristol-Water* makes no Alteration.

Tinct. Mart. Mynsicht. turns red with *Lime-water*, with *Bristol-Water* no Change in the Colour is made, any more than with common Water.

All which Experiments, and others that might be made, are enough to prove, that *Bristol-Water*, and *Lime-water*, are two different Things; and that however they may agree in some Particulars, no Conclusion can be drawn from such Agreement: For if they differ so much in others, we are still in the Dark; and therefore may as well let the Comparison alone. And thus other Experiments may be made to the same Purpose with other Substances, in order to prove whether the Water is imprægnated with them or not: And although it may be said, that Nature may so blend Things together, or otherwise alter their Properties, that they shall not be discoverable in their natural Shape, this will not make these Experiments useless, because, if so alter'd, they are not the same; which was all we un-
under-

undertake to prove by them. But I shall now proceed to consider the Water in another Light, and endeavour to be a little more instructive.

The general Opinion concerning *mineral Waters*, has been, that they receive their Virtues from certain mineral Particles, taken up by them in their Passage through the Earth; and thereby differ from common Water, which receives no such Imprægnation. Hence People have not only been inquisitive into the Nature of the adjacent Soil, and into the Salts, and other mineral Substances, discoverable in these Waters, but have also taken upon them to declare, what Sort of Substances can imprægnate them, and what not. Thus for instance, they will allow of no Salts but such as are fossile, and naturally found in the Body of the Earth: And as to Metals, they tell you, that Water may be easily imprægnated with *Iron*, and *Copper*, because the *Vitriol* of these Metals exists naturally in the Earth; but that *Gold*, *Silver*, *Lead*, *Tin*, &c. cannot communicate any Virtue to Water, because there is no Vitriol of these Metals existing, but what is made by Art: And

Metals,

Metals, unless they be first converted into Salt, *nisi solutis principiis*, as the *Chymists* speak, cannot yield any Virtue to Water. They also allow, that Water may take up Earths, and Sulphurs; which latter, they suppose to be the Cause of all that Volatility and Heat which is observable in these Springs. And this is in short the current Theory concerning mineral Waters; but labours with so many Difficulties, that I really wonder People have sat down so contented with it.

For *first*, If Waters are imprægnated, from what they take up in the Channels though which they pass; how is it that this is done so constantly, and so equably? Water having once found its Way, flows naturally in the same Channels, which must be soon exhausted of every Thing that is soluble in it: And if it were not so, it is not to be conceiv'd, how it should be equably supplied, at all Times, with that which gives Virtue to it; much less can the Heat of *mineral Waters* be accounted for, this Way: For if it arises from the Effervescence of Substances, which we find upon Experience to generate Heat, the Difficulty encreases upon us, how they can be *equably* heated.

heated. Add to this, that all such Fermentation is but for a Time, whilst the Conflict lasts; after that is over, the fermenting Parts remain dead and unactive, which makes the Thing incredible; because we must not only conceive in this Case, a constant Generation of new fermenting Substance, but some Provision must be made, to convey that which has done its Work away, as waste Rubble, and of no farther Use.

Secondly, as Salts are more soluble in Water, than any other Substances, it is reasonable, upon this Supposition, to think, that those should be imbibed ofteneft, and in greateft Quantity, which abound most, which is the *acid fossil Salt*; and yet *Hoffman* says, no such Salt is predominant in any *mineral Water* known. *Primus ego omnium fuerim, qui evidentissimè & momentosis rationibus docui, quod in acidulis, minimè acidum, qua tale, sed potius acido contrarium, alkalinum nempe, (tam terreum quam salinum) elementum, quod cum acido promptissime confligat, reperiatur* *.

* *Hoffman de viribus fontium medic.*

Thirdly,

Thirdly, As all these Substances, with which they suppose that Water is imprægnated, are of a fix'd Nature, how is it that they do not appear upon Evaporation, or at least in so small and insignificant a Quantity? Why it may be said, they are volatiliz'd by the Admixture of *Sulphur*; but although two or more Substances fermenting together, beget that which is volatile, yet as the whole is supposed soluble in Water, it is very strange that nothing of these Substances should be discoverable in it, either in a volatile, or fix'd State, and that *Sulphur* itself should not be found in it, which the above-cited *Hofman* says, is seldom or never the Case.

What I believe has given great Occasion, to this unsatisfactory Theory concerning *mineral Waters*, has been an Opinion that all *Springs* are from *Rain*; which if true, then these Waters must receive their Virtues in their Passage from the Surface of the Earth, to the Springs whence they arise. And this they think they are very sure of, not only from the Laws of *Hydrostaticks*, which forbid any Water to arise from beneath upwards, above the Level of the

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Place from whence it comes, but also from *Experiment* ; whereby they undertake to prove, that there is a Quantity of Rain falling yearly, sufficient for the Supply of all *Springs* and *Rivers*, though we allow two Thirds of this Quantity, to be consumed by *Vegetation* and other *Evaporation*.

And this indeed seems to answer one considerable Objection made against *Springs* being from *Rain* only, *viz.* that the Rain was not sufficient for the Supply of them ; and by the generous Allowance they make for *Evaporation*, of two to one, it is not to be wonder'd that the candid Reader is convinc'd. But this *Experiment*, upon a closer Examination, will not hold ; for it is proved by *Gualtieri**, that the Quantity consumed in *Vegetation* only, is more than the whole of what they observe to fall : Nay, that upon a moderate Calculation, the *Rivers* which run into the Sea, exceed this Quantity two to one ; not to mention the Article of *Evaporation* singly, exclusive

* *Reflessioni sopra l'Origine delle Fontane* ; published at *Lucca*, 1725 ; printed in the *Journal des Sçavans*, and translated in the *Memoirs of Literature* for August, 1725.

of *Plants*, which he also proves to exceed the Quantity of Rain which falls, and thereby entirely overthrows the Force of this Experiment, however plausible it may seem at first Sight : And indeed if Rain descended according to the Laws of *Hydrostaticks*, in Supply for *Springs*, and this was the only Cause of them, I cannot see how the higher Parts of the Earth could be supplied with Water. By the higher Parts of the Earth, I do not mean *Mountains* and *Hills*, but those Parts near the *Equator*, where, according to late Observations, the *Diameter* of the Earth is greater than elsewhere, and the Land too high to receive Water from other Parts, though it needs it more than any. And as I think I have greater Authority than any Philosopher can bring, to be of a contrary Opinion, I shall proceed upon the old Doctrine, of an *Abyss* in the Centre of the Earth, and Waters coming from thence, against all the Laws of *Hydrostaticks*, and declarative of the Almighty Hand which has so ordered it.

I do not mean that *God* is here the immediate Agent, but that it is performed by natural Causes, far beyond the Reach of

what is to be learnt from *Hydrostaticks*. And here I cannot but take Notice, of the modern Way of explaining the grand Operations of Nature, by the common mechanical Principles, established in Arts and Sciences; and from these low limited Appearances, accounting for the most wonderful *Phænomena* in Nature, and so giving Laws to God, instead of *Glory*. If these Gentlemen would return to the first *Elements*, and not despise what has been taught from all Antiquity—* *Quod initia vel elementa rerum sunt aer, ignis, aqua, & terra; è quibus aer, & ignis, movendi vim habent, & efficiendi: reliquæ partes, (nempe aqua & terra) accipiendi, & patiendi*; they might be nearer the Truth, at least not liable to that most just Rebuke, which *Cicero* gives the Philosophers of his Time,—† *Quod cùm in rerum naturâ duo quærenda sint, unum, quæ materia sit, ex quâ quæque res efficiantur: Alterum, quæ vis sit, quæ quidque efficiat: de materiâ quidem disseruerunt, vim & causam effi-*

* *Cicero*. Acad. Quæst. Lib. 1.

† *Cicero* de Finibus, Lib. I. towards the beginning; the whole Passage is well worth reading.

of BRISTOL-WATER. 165
ciendi reliquerunt ; which, he says, was
then (as now) the *commune vitium*.

But to proceed ; if we believe that there
is a Collection of Waters in the Body of
the Earth, which gives Supply to Springs
and Rivers, as the *Scriptures* teach, we are
no longer confined to the scanty Drainings
of what Rain can bring, in its Descent
from the Surface of it, but we have the
whole Globe to range in ; whence we may
with greater Probability expect Supplies,
both constant and sufficient, for the Impræg-
nation of *mineral Waters* ; and that not,
as I conceive, in the Manner which has been
imagined, by the Water being imprægnated
with *Salts*, and other mineral Substances,
but chiefly by Means of *imprægnated Air*.

But before I proceed, I must beg Leave
to observe, that this Doctrine of the Cir-
culation of Waters, from Center to Cir-
cumference, is of great Antiquity ; inso-
much that * *Homer* and † *Plato* expressly

* μέγα σθένος Ὠκεανοῖο

Ἐξ ὑπὲρ πάντες Πόταμοι καὶ πάσα θάλασσα

Καὶ πάντα Κρήνας καὶ φρέιατα μακρὰ νάουσιν.

Il. φ. 195.

† Ἐἰς τὸτο το χάσμα συρρέουσιν τε πάντες οἱ Πόταμοι,

Καὶ ἐκ τούτου πάντων πάντες ἰκρέουσιν.

Plato in Phædon. ad finem.

declare

declare it ; which I the rather mention, because it looks as if they had it from Tradition ; for had they been left to their own Imaginations, it was very natural for them to conceive, as many do now, that all Springs were from Rain ; but they could surely never have thought of an *Abys*s, and Waters coming up from thence, unless they had been told so.

That Air penetrates, and passes through the whole Body of the Earth, is proved by * *Dr. Woodward*, that it pervades Water, and circulates with it, appears partly from the Nature of Springs, which are for the most part very full of it, and partly from what is observ'd by *Miners*, that they never want a Supply of fresh Air, where there is a Flow of Water, even at the greatest Depths ; and it is well known, that *Fishes* live at the Bottom of the Sea, which they could not do, without Air. Nor indeed can I well conceive, how Water should be preserv'd from Corruption without it : For so far as we can judge by Experiment, Air is the Life of Water, and what chiefly consti-

* Natural History of the Earth illustrated ; *vid.* Letters in the Preface.

tutes the Difference between that which is wholesome, and that which is not.

But if Air pervades Water, and circulates with it, it is plain that if this Air is imprægnated with any mineral *Effluvia*, the Water will be so too, by Reason of the Air included in it. That these mineral Fumes are here and there to be found in great Quantities, in the Body of the Earth, appears from divers *Exhalations*, *Explosions*, &c. observable both above Ground, and below : And as we observe that *Stones*, and *Ore*, at the Bottom of deep Mines, are very hot ; and that the lower we go, the hotter it is : As also, that *Vapours* arise with greater Force from beneath, upwards ; it is reasonable to think, that Heat is disseminated thro' the Body of the Earth, and moves from within, outwards ; and that this is the Power by which Waters rise, and Minerals are put in Action : And as this Heat is in some Places encreased to a very high Degree, by Means of inflammable Matter, which if it meets with, is easily actuated and put in Motion by it, and might endanger an Explosion, were not some Vent provided for it, this Inconvenience is

prevented by Means of Springs, which seek their *Exit* from within outwards, and convey with them vast Quantities of Air, which, by being pent up in the Body of the Earth, might otherwise be of evil Consequence : So that the Channels thro' which Springs flow, may be considered as so many Vent-holes, (*quos aquæ subeunt et auræ*) serving to give Passage to that which would otherwise be destructive of the Whole.

It is highly probable, that common Springs, carry nothing but common Air. Mineral Springs, Air replete with Mineral *Effluvia*, though not of sufficient Activity to communicate any Heat to the Water : But others, there are, which are not only imprægnated, but also heated from this Cause ; and neither of these, I say, receive their Virtues, or their Heat, from Salts or other Substances soluble in them ; but from Air, replete with Mineral *Effluvia*, which insinuates itself into them, and intimately unites with them, and very often heats them ; so that we are no longer confined, to a few natural Products of the Earth, dissolvable in Water, and such like unactive Principles ; but are open to all that Heat itself can produce, from any mineral Body whatsoever.

But

But it may here be asked, how I account for the *equable Heat* and Impregnation of these Waters, and whence it is that I expect a continual *Supply*? But as I do not exercise myself in great Matters, which are too high for me, I do not pretend to a full and satisfactory Answer, only shall propose what appears to me to be most likely, leaving it to the Judgment of the Reader.

First then, as to the continual *Supply* of this mineral Matter, I think it may in some measure be conceiv'd, by what is observed of Mount *Ætna, Vesuvius*, and other burning *Volcano's*, which continually smoke, and send forth, at all Times, large Quantities of combustible Matter. These are what I call dry *Vent-holes*, and are ordained for the same Purpose as the *watry ones*; and if these are actually supplied at all Times, and in all Ages, with such large Quantities of mineral Matter, may it not be conceiv'd from hence how *Springs* may be constantly supplied with much less Quantities of it?

But altho' the constant *Supply* may be thus accounted for, it is well known that these *Volcano's* send forth very different

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Quantities of this combustible Matter, at different Times ; and therefore a further Question will arise, how Springs are *equally* supplied, and thereby equably heated ? And here I beg it may be observ'd, that I do not conceive *mineral Waters* to be imprægnated in the narrow Parts of their Channels, as they pass along ; but by Means of some *cavernous Hollow*, through which they run, and in which they receive their Virtues ; which *Caverns*, being supposed full of mineral *Effluvia*, I say, the Water will be equably imprægnated, either if the Air enclosed, is kept in an equable Degree of Heat, or the Water is saturated ; both which are possible Cases. By *Saturation*, I mean the taking up as great a Quantity as the Water will bear ; in which Case, as here is mineral Matter sufficient, the Water will be always saturated, and so carry a like Quantity at all Times.

All *mineral Waters*, then, arise either from imprægnated *Water*, or *Air*, or *both*. By imprægnated Water, I mean Water imprægnated with any Substance soluble in it ; and under this Head may be rank'd all such as owe their Virtues to Salts, tho' Air is probably assisting to most of them. By
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imprægnated Air, I mean Air imprægnated with any Fume which Air can take up, and intimately united with the Water; which is the Case of the *Thermæ*, and all other *mineral Waters* not of the salt Kind. And as all the Appearances observable in these Waters, answer to this Account given, better than to any I have yet heard of, the Recital of a few of them, may give some additional Proof, to what has already been advanced.

Hence then we learn, why that which gives Virtue to mineral Waters, is of such a volatile untenable Nature, that it so easily evaporates, and can by no Art be drawn forth, and exhibited to View. Did the Virtues of these Waters depend upon any Substances soluble in them, one would imagine something of a fixed, or volatile Nature, might be extracted from them, in which we might perceive the like Properties; but if Air is the Agent, the *Chymist* will never be able to analyze it into its compounding Parts.

Hence also we learn the Reason why we can by no means imitate these Waters, by any Composition of our own making;

even where, from divers concurring Circumstances, we can give a good Guess at the Mineral predominant in them. Thus, for instance, in *chalybeate Waters*, tho' we are pretty well assured they are imprægnated from *Iron*, yet they contain nothing of *Iron*, *qua tale*, but only a volatile Fume of the chalybeate Kind, which we cannot equal by any Preparation of it whatsoever.

Hence also appears the superior Virtues of these Waters to other Medicines; we not being able to subtilize Bodies, much less enliven and imprægnate Air, as Nature does. And when I consider *mineral Waters* as giving Vent to heated Air, which would otherwise be our Ruin; and at the same time pouring forth upon us, the inestimable Blessings of Health, I cannot help looking up to Him, in whose Hands are the visible and invisible Parts of this Globe, and of whose Wonders it may be said, in a much sublimer Sense than the Poet,

*Quantum vertice ad auras
Æthereas, tantum radice ad tartara
tendunt.*

Lastly,

Lastly, we learn from hence the Cause of the great elastick Force of many of these Waters ; insomuch that they cannot be bottled immediately from the Spring, for fear of bursting the Bottles : And indeed I know not of any one *Phænomenon* they exhibit, which is not fairly accountable from Air within them, *eas occultè exagitant & medicant.*

But it is now time to make some Application of this to *Bristol-Water*, which I believe to be a most pure light Water, as free from Recrements as any Water whatsoever ; which appears from its carrying uncorrupt round the whole World, and receiving no Alteration, as other Waters will, from hot Climates ; nor do I think its Virtues depend upon any Imprægnation of the Water, but upon *imprægnated Air*, which it is very full of, as may be observed at the Pump, by the numerous Air-bubbles that are in it. What it is that imprægnates this Air I do not pretend to say, and therefore have taken a different Method of declaring my Sentiments of it, chusing rather to enquire what its Virtues really are, than on what Principles they depend.

And

And thus having finish'd what I had to say, I shall conclude with observing, that as the Parts of *Animals* and *Vegetables* found in the Body of the Earth, bear Witness to the Scripture Account of the Deluge, so *mineral Waters*, which cannot be explain'd without Circulation of Water from beneath, upwards, seem to me to be a standing Evidence, among other Things, of the Truth of *Holy Writ*, in regard to what it says concerning the Blessings of the Deep, against those *Naturalists*, who teach that all *Springs* are from Rain only; and so pronounce upon God's Works, without attending to his Word, even in those Matters in which it is clear and express.

My Design in the foregoing Treatise, has been to acquaint *Physicians* with the true Virtues of *Bristol-Water*; who, as they live at a Distance, and cannot inform themselves in many Particulars, must depend chiefly on the Relation of others. Were there any Thing extant on this Subject that gave me Satisfaction, I should have spared myself this Trouble; but when I found, that the Books wrote for this Purpose, were very deficient in many Points, and I was

settled in this Place, and owed my Life, in great measure, to this Water ; I thought it might be commendable in me to take some Pains in this Matter, and employ my leisure Hours upon a Subject, in which my busy ones were like to be so very conversant. I know the World too well, to commence Author out of Interest ; nor am I Fool enough to have any Vanity this Way ; If my Readers will accept of what I have done, as a *tabula votiva*, given out in Acknowledgement of the Escape I have had, the Thing speaks itself, *Hoc ego putabam esse omne ingenui atque liberalis animi officium.*

I have examined into the Virtues of *Bristol-Water*, according to the Plan laid down in my Preface ; and have gone through this Subject, in a manner which has indeed been pointed out by many before me, but never as I know of actually pursued, by any ; and which, I hope, may serve as a Direction to others, who shall take upon them to explain the Virtues of other mineral Waters.

I have in the Course of this Treatise, consider'd a *Genus* of Distempers, arising
from

from Acrimony; and have shewn that it is the latent Cause of *Hecticks, Diabetes, Consumption*, and several other different Species of Disorders.

I have also taken Notice, that it is not Acrimony, as such, which is the Cause of these Diseases, but that Sort of Acrimony only, which tends to quicken the Circulation, and encrease the Secretions: And in so doing have, I hope, settled the true Use of *Bristol-Water*, by declaring the very specifick Case which it is good for, *viz. Acrimonia cum secretionibus auctis*; or what I call in *English*, a *Hectical Acrimony*.

The Freedom I have taken in censuring the Opinions of others, will not, I hope, be imputed to any Inclination I have to shew my Dislike and Disapprobation of what they have said, but rather to the Nature of my Subject, and the *Enquiry* which I profess to make in my *Title-Page*.

F I N I S.